RAILROAD GAZETTE

FRIDAY, APRIL 18.

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# Contributions.

## Cast-Steel Driving Wheels.

NEWCASTLE ON-TYNE, March 26, 1890.

TO THE EDITOR OF THE RAILROAD GAZETTE:

With reference to the article on cast-steel driving wheels in the *Railroad Gazette*, dated March 7, I beg to say that the statement therein made as to the origin of the wheels is not correct. You state that they are made in Belgium, whereas they are actually made in Germany. I import them in very large quantities and supply them to the North Eastern Railway Co., as well as to many other locomotive builders and railway companies in Great Britain. Mr. T. W. Worsdell, Locomotive Superintendent of the North Eastern, Gateshead will be able to confirm the correctness of the above statement.

AUGUST REICHWALD.

## Tracks in Locomotive Shops.

TO THE EDITOR OF THE RAILROAD GAZETTE:

I find among railroad men much difference of opinion regarding the best arrangement of tracks in a locomotive building shop. The opinion seem to be about equally in favor of short parallel tracks having capacity for one engine each, and three long tracks having capacity for several engines each. I have heard arguments advanced for both arrangements. Nearly all locomotive builders in this country are using the short tracks, and many railroad shops are constructed in this way. The new shops at Horwich, England, and some prominent shops here, have long tracks with a capacity of from 10 to 20 engines. I find a few who favor the radiating tracks with a turntable in the centre.

As this is an important question and one which many railroad men have to settle before building, it seems worthy of discussion, and I would like to obtain an expression from your readers regarding it.

TRAVELER.

## Ventilation or Refrigeration.

APRIL 14, 1890.

TO THE EDITOR OF THE RAILROAD GAZETTE:

The whole gist of Mr. Pierce's argument against the efficacy of my ventilation proposition is based upon the popular fallacy that the natural variation of temperature, which is supposed to be healthful to the fruits up to the moment that they are harvested; then, strange to say, suddenly becomes so ruinously unhealthy to the gathered fruits as to necessitate being supplanted by an artificially uniform low temperature, for their preservation. Now, I do not believe it is the "constantly changing temperature of the air" that wastes the fruit in transit; but I am satisfied that it is the insufficient change of the air among the fruit; it is the stagnation, the confined air, saturated with the fruit sweat, etc., that causes mold and decay; and I believe that, such an ever-changing supply of clean, fresh air, in the closest possible contact with the fruit, as will promptly remove the noxious gases, etc., from the car, will largely eliminate the cause of deterioration. Therefore, in this, I do not aim to "secure an even temperature by ventilation;" I do not seek a remedy in the temperature of the air at all, but solely in the cleansing qualities of the air as a vehicle to carry away the destructive fruit exhalations.

The uniformity of temperature, of itself, will not save from spoiling. The temperature of the air in the fruit holds of the ocean steamships is as uniform as it is stagnant; it is laden with the ruinous fruit exhalations, and is very disastrous to the fruit.

True, a slight circulation of air (a species of ventilation) can be obtained by skillful refrigeration of cars, and fruit apartments in boats, and then it is the circulation—the ventilation—that preserves, by removing the exhalations to the ice chamber, for their more or less absorption by the melting ice. But I propose to remove these exhalations more effectually without the cumbersome use of ice, simply by sweeping them clean out of the car, or other chamber, by using the natural air only as a removing vehicle, and not as a conveyor of temperature; which will be better in every respect, wherever it is the exhalations that have to do with the life of the produce.

R. M. PANCOAST.

## Purposes and Right Uses of Car Seals.

TO THE EDITOR OF THE RAILROAD GAZETTE:

I note communication in your issue of March 14, from "H. B. M.," who thinks that I miss the point in saying car seals are of little value except to enable the road where the mischief is done to investigate quickly and directly. Now, how much was the point missed? I have never yet heard of a check clerk or a freight handler who did not make more or less mistakes, and do not know of any seal which will detect or prevent such mistakes. Until we get such a car seal, will the breaking of a seal prove that the freight was put in the sealed car? If not, how can the breaking of a seal prove that the road where it was broken lost the goods, and ought to pay the whole of the bill? Plenty of cars go through with seals intact, in which shortages occur. If a broken seal "sticks" the road where it is broken for the loss, then the proposition must be equally correct—that where a seal goes through intact the road putting on the seal should stand the whole loss. Yet "H. B. M." says that when a seal goes through intact, and there is a loss, it shall be prorated from initial or sealing point to destination. This does not seem fair, because, under the circumstances mentioned, if a seal proves anything, it proves that the freight was not loaded as billed, and the responsibility for the loss is much better located than the breaking of a seal can locate it.

The fact is that line business is partnership business. Partners must trust one another. They make mistakes sometimes, but the firm stands the loss. On a line, the two extreme points are constantly receiving for each other, as well as delivering for each other. In fact, it is fair to consider both termini of a line as agents each of the other and also of the intermediate roads, over which the business is sent. All have a revenue from the business, and sharing the gains, to my mind, involves the duty of sharing the losses. It is easy for claim agents to fix responsibility as long as all they desire to know in order to reach a decision is where seals were broken. I believe it is quite common to do this, but it is not right, and does not prove in case of loss that the road which pays is not paying the value of freight which it never had in its possession, and therefore could not lose.

The examination of seals at all points (except initial and terminal points) must in these fast days be hasty. There is no time to climb up and examine carefully, for freight must move; it must not be delayed. I cannot, therefore, see why a road ought to pay for anything which it did not lose or damage, even if an employé might possibly be careless and pass an imperfect seal. I admit "H. B. M.'s" claim that seals are simply to have *some* basis upon which to act in the settlement of loss and damage. *Some* basis may suit, but a *right* basis is much better, and that seal records are not a proper basis I think I have shown.

Notwithstanding "H. B. M." claims less correspondence under his theory of seals, I would say that in my experience such correspondence is constantly going on. I know of a case, where there has been considerable correspondence, in which a car loaded with oats had a broken seal and was claimed 200 bushels short. There is no evidence in the case but the broken seal, but no man of any experience will say that such a loss could occur without some sign. As to the value of a seal when a car is loaded by shipper, I am not aware that courts have decided that car seals intact are positive evidence, and that their silent testimony will overthrow a shipper's oath. I am inclined to think it would be like notations on bills of "shippers' count," and "loaded by shipper," and that something more than negative evidence would be required to escape responsibility for failing to deliver freight which a shipper swears he loaded and which a railroad company received without checking or verifying in any way.

If seals are almost conclusive evidence that goods were never loaded, when the shipper loads the car, are they not equally conclusive when car is loaded by a railroad company's employés?

Looking further at "H. B. M.'s" communication, I see that I have claimed too much in the case of a car loaded by shippers. I note that he only claims that "a claimant will often withdraw a *small* claim which he would, were not the car sealed, insist upon having paid." The larger claims, then, are likely to need some other evidence to escape paying. This shows the weakness of the claim for benefit of seals when shipper loads cars, and if weak in that case, the argument is certainly as weak for all claims depending for evidence upon car seals.

I did not in my previous letter compare a lock to a seal. What I said was, that settlements of loss and damage to freight should be made on the same basis as it would if a lock were used without a seal. I did not claim that a seal would guard the freight, because it will not guard *so well* as a lock, being more easily broken; but it will show if it is broken, while your lock would readily be opened with a key and show no sign—not so much difference, after all, for we all know seals are often tampered with, and show no sign until taken off at destination.

As to fines. You cannot justly fine a man until you prove him guilty. Would you fine a check clerk if he told a man to load his freight in car 329 and it was loaded in car 239? How will you check a check clerk? He made his entry in his shipping book, or made his check mark in B. L., shipping order or manifest, and he sticks to his mark. He must do so; and how can "H. B. M." or any one else, as a rule, gainsay the record? If a fine hangs over a man, do you not make him very positive as to his record, and prevent him giving you the benefit of any doubt which might arise in his mind? This is one of the things very difficult to convict a man of. It is true that nine times out of ten a man can tell whether a seal has been tampered with; but that is just the point; and the tenth time is what gives rise to much of the doubt in the matter of seals.

There is no way to settle claims fairer than that losses be settled by the partners in a line *pro rata* to their earnings. It certainly is much fairer than to settle on this basis for losses which occur on cars going through with seals intact and then charge the total loss to a road where a seal may be broken. This has been done even when seals were broken by an employé to unload or load freight.

SENEX.

## Position of Steam-Heating Couplings.

We give below extracts from a number of letters that we have received from railroad officers and manufacturers of steam heating apparatus, which confirm the position that we have heretofore taken as to the importance of so placing the steam-heating coupling, that the drip from it shall not freeze on the air-brake coupling. Some of our readers will remember that immediately after the Bay View accident, we said that the probable reason why the brake was pulled off was that the coupler was frozen by drip from the steam coupling. This has since been confirmed from several sources, and has been accepted as the explanation.

T. N. Ely, Pennsylvania Railroad: The system of steam heating which we think is the most promising and has the most advantages is that with which we have been experimenting for the last two years, namely, the "return system." As this involves the use of two sets of couplers, one on either side of the air-brake hose, we have not found it necessary to pay any attention to the air-brake couplings. We certainly think that the steam coupling should be below the air-brake coupling in systems where the coupling is a central one (where only one line of pipe is used). I presume the reason why so many of the steam-heating companies wish to keep it above the air-brake hose is to get rid of the sag formed between the cars, and which is necessary when the steam coupling is below the air.

A General Manager: The advantage to be gained in locating the coupler overhead is that the condensation can be disposed of without uncoupling the hose at terminals. The advantages to be gained in having the couplings located underneath the car are that the coupling can be made while they are making air brake couplings, and that any leakage or drippage from them will not fall on to the platforms. The disadvantage in having them under the car is that they are the lowest point on the system, toward which the condensation naturally flows when the steam is cut off, as a result of which they must be uncoupled at terminal stations, or wherever the engine is detached long enough to allow freezing. There is a device on the market now in which there is a valve which closes under the pressure of steam and opens as soon as the pressure is reduced to less than ½ lb., by the opening of which the water of condensation from the main train pipe is allowed to discharge to the atmosphere; and as soon as pressure is applied it is again closed. These are being used pretty extensively, and I have heard some railroad men say they are objectionable on account of leakage in the valve seat, while others again claim that they are a good thing. If a proper material can be found for these valve seats so as to prevent leakage, I believe, all points considered, it more desirable to have the couplings located underneath the platforms.

E. St. John, Chicago, Rock Island & Pacific: It is my opinion that the steam-heating hose should be located below the air-brake, unquestionably.

J. N. Barr, Chicago, Milwaukee & St. Paul: We use the overhead coupling for steam hose, because with this location the trapping of water is avoided entirely, and the pipe can be so laid that there is a perfect drainage from the main pipe to the trap located at the lowest point of the pipe. With the hose under the platform, there is no construction which can attain these results. I have no doubt that in mild climates the hose coupling under the platforms can be made to work with perfect success, but in the intense cold weather we have in the Northwest, we made a failure of it. With our present arrangement, unless the traps become inoperative, we have a satisfactory arrangement.

P. P. Wright, Lake Shore & Michigan Southern: With the use of metallic connections for conveying steam

through the train, we experienced some trouble on account of the leaking of the steam coupling between the cars. This leakage was directly over the air-brake hose couplings, and was a source of annoyance. We experimented with several different kinds of metal connections, and all with the same result. We now use hose, which almost entirely prevents leakage, and has stopped the dripping of water on the air hose couplings. It is very desirable that whatever is used to convey steam through the train should be made as direct as possible, and, therefore, not drop below the air-brake hose, as the locating of the steam connections below the air-brake hose would be only to prevent the dropping of water from the steam couplings.

J. M. Toucey, New York Central & Hudson River: This company does not use hose for steam heating, for the main reason that the sagging of the hose (which, without doubt, would have to hang below the air-brake hose) would form a trap, and the water formed by the condensation of the steam would quickly freeze in that position. We thus far have preferred a straight coupling for steam, and we have as yet no reason to change our preference.

R. Miller, Michigan Central: The air signal hose comes below the brake hose, and the steam coupling would come too low if placed below both; therefore for this and other reasons we place the steam coupling above the others. Of course, if it were below, there would be no drip on the air couplings, but we cannot so place it practically.

John Player, Wisconsin Central: The steam heated train on our road has metallic couplings, not using hose, but with me there is no question but steam hose should be located beneath the air hose on account of drip from condensation or leakage.

W. E. Candee, Martin Anti-Fire Car Heater Co.: With regard to the proper position of a steam coupling with reference to the air brake, in case we did not couple them as we do now, we should prefer making the connection on the side, which can be done and the cars reversed. We would thus avoid an extra lift of the water of condensation which would be necessary in case the steam couplings were dropped below the air brakes.

Robert Andrews, The Safety Car Heating and Lighting Co.: We have always considered it best to have the steam couplings below the line of air-brake couplings, for the reason that they are heavier, and naturally sag down more than the lighter couplings, and should not be placed in a position where they would be likely to interfere in any way with the air brake coupling, which might be the case if they were placed above this line.

Gold Car-Heating Co.: The steam coupling should undoubtedly always be placed under the air coupling, and it is our invariable rule to do this. We have heard of steam-heating companies placing them above, and the leakage (as no other company has traps on its couplings but us), dropping on the air brake, freezes it up and ruins it. Although our coupling is steam tight, we should never place it above the air-brake hose, even without traps, and of course with traps it is out of the question.

D. D. Sewall, Consolidated Car-Heating Co.: The safer position for the steam coupling I consider to be under the air coupling, as then if any leaks occur, which are liable, no damage can be done to the air hose or couplings. The dangers that have been feared from the pocket that would be formed by hanging steam couplings so low have been found in practice to present no difficulties even in passing steam through long trains.

J. H. Sewall, Consolidated Car-Heating Co.: I am thoroughly impressed with the importance of placing the steam connections below the air-brake connections, and, in arriving at this conclusion, I am choosing the least of two evils, to wit.: The drip of water on the air-brake connections, and the necessary pocket involved in placing the steam connection below the air brake connection. As to the drip, the result is disastrous, as it effectually destroys the automatic feature of the air-brake connection in freezing weather. As to the pocket formed, in order to pass the steam connection below the air-brake connection, it is obvious that no connection can be made between cars without passing below the end sills, if the main train pipe is carried below the cars, and the highest connection of this sort that is now in use creates a pocket of 15 in., if we take the lower side of the car sills for a standard level, while to pass below the air brake connections it is only required to increase this pocket 10 in., or 25 in. below car sill. As a column of water $2\frac{1}{10}$ ft. high represents one pound pressure per square inch, and as the difference in height between the present appliances is only 10 in., it is surely better and safer to add less than one pound pressure to the train pipe for the purpose of removing the water of condensation from this increased pocket, and have what dripping there may be fall from the air-brake connection, than to pass the steam connection above the air-brake connection, with the fearful results that are sure to follow.

F. G. Botsford, Botsford Car Heating Co.: I have found from experience that it is better to place steam couplers below air-brake couplers. If the steam coupler is above the air coupler, and there should be a leak from any cause, it would strike the air coupler, and in freezing weather would cause trouble. I have known of instances where the water dripping on air couplings froze them up in such a shape as to render air brakes useless n the rear of the car that had the air brake frozen.

## The Inter-Continental Railroad.

Since the Pan-American Congress has recommended an inter-continental railroad, there has been considerable discussion of the subject. Very little has been said, however, of the probable—or possible—route through southern Mexico, Central America and Columbia. I have seen it stated that a railroad through these countries is not feasible; but as an engineer, and one who has been over the ground, I wish to correct that impression. As there is a line now being constructed from the City of Mexico to Oaxaca, we can begin the discussion as to what is the best route from the latter city.

The route that presents the fewest difficulties, and the one that would cost the least, is from Oaxaca to Tehuantepec, and thence down the Pacific side of the Sierra Madres to Panama. This route is also the shortest, as will be seen by a glance at the map. Perhaps it would be as well, before going further, to give my reasons for claiming this to be the best route.

To begin with, the backbone of the continent is very much nearer the Pacific than the Atlantic coast. On the Atlantic side the country intervening between the mountains and the level plain of the coast is cut up into tablelands of different elevations, and crossed by many deep cañons and *barrancas*. There are also many spurs from the mother range that would make the line more difficult of construction. But the main objection to a route on this side has yet to come, viz., the peninsula of Yucatan. To follow the coast line would, of course, greatly increase the distance, and any attempt to cut across the head of the peninsula would throw the line into the mountains of Guatemala, about as rough a country as there is on the continent (see map). The mountains of Guatemala and Spanish Honduras reach to the Atlantic coast, being a continuation of spurs from the main range, and no railroad could be built through them without very great expense. The route on the Pacific side is not only the shortest, but would pass through more important towns and cities than any other route.


MAP SHOWING A ROUTE FOR THE PROPOSED INTER-CONTINENTAL RAILROAD.

Want of space will not permit me to go into the resources of the country, so I will content myself with stating that the Pacific coast is the most developed. Oaxaca is a city of 30,000 inhabitants, situated in a very fertile mountain valley. Between this city and Tehuantepec is a very rough, broken and mountainous country, which will be the most difficult and expensive part of the line to build. This is the only barren and unproductive part of the whole route, but there is mineral to be found everywhere, and in several places I saw signs of coal. There is timber enough for construction, plenty of scrub oak for ties, and on the higher mountains good pine. While pounding over this country on a mule I have wished more than once that the Pan-American Congress had been held years ago.

Tehuantepec is a city of 15,000 inhabitants, mostly Indians, and is located about fifteen miles from the port of Salina Cruz. The Tehuantepec Railroad has been completed from the port to the city, and some little distance beyond; and there have also been some twenty miles of rails put down on the Atlantic side from Minatitlan. There has been money enough sunk here to build 20 such roads, but it is no nearer completion than it was 10 years.

From Tehuantepec to the border of Central America, and in fact to Panama, there will be found no engineering difficulties. Leaving Tehuantepec, the proposed road would follow the coast line at a distance of from 20 to 30 miles from the beach, where the ground is high enough to preclude all danger of inundation, and not near enough the mountains to be broken up into foothills. Within the limits above mentioned the grading will not amount to much, as it is a level plain, reaching clear across the state of Chiapas and into Guatemala. To locate the line nearer the coast would throw it into the swamps, and to go nearer the mountains would mean heavier work and rock cuts. The most expensive items of construction here will be clearing and bridging, for it is a very heavily timbered country, and there are numerous small streams. The timber is good, there being plenty of Spanish cedar, and several varieties of mahogany. The rubber tree is also plentiful. Labor is scarce and not particularly good; that is, some of it. Any attempt to work it by the day will result in loss of money and temper. Everything is done by task work, and if this system is used from the start it will do away with a great deal of annoyance.

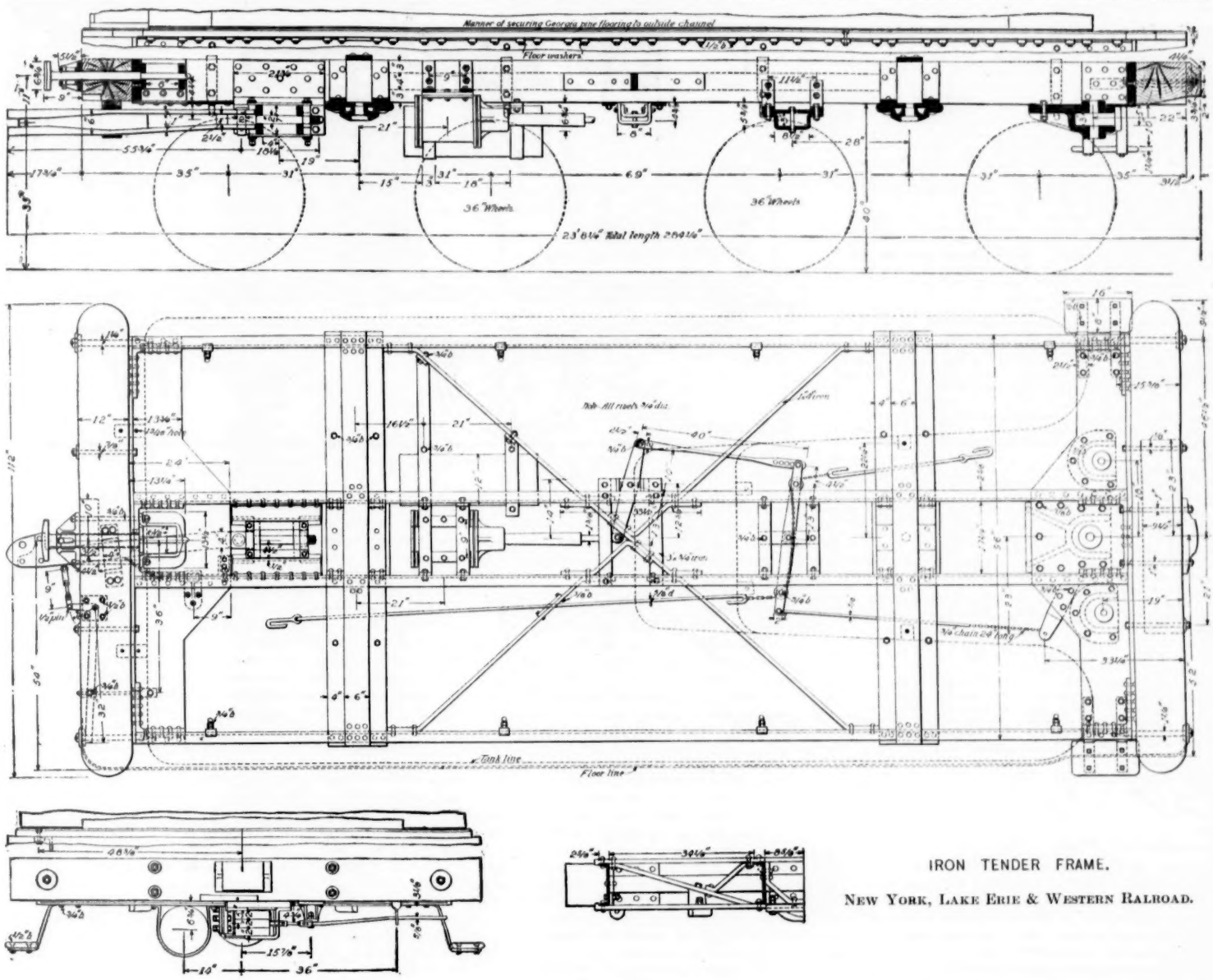
Tonala, a city of 12,000 inhabitants, and Tapachula, a place of six or eight thousand, are the only towns of any importance in the state of Chiapas reached by this route. Both of these places are situated some little distance inland, but each has its own port. Chiapas is an almost unknown and undeveloped state, but, like the Central American Republics, will grow almost anything. Between the lowlands of the coast and the higher mountains, one can get any climate desired. I have known the Indians to grow three crops of corn in a year on the coast. On the foot-hills is good coffee land. Just over the line in Guatemala is raised some of the finest coffee in the world; so good, in fact, that you will not see it quoted in the market, because it is all sold as Mocha.

The only means of communication at present with the outside world is by the Pacific Mail Steamship Company. I would not for the world say anything against this company, but if one has plenty of time, he can make good money by walking.

Crossing the line into Guatemala we reach Retaluleu, a place of 8,000 inhabitants, and the centre of a large and rapidly increasing coffee district. This town has a railroad to the coast, a distance of 26 miles, and surveys have been made to Quesaltenango, a city of 30,000 inhabitants, about 50 miles from Retaluleu. The general character of the country is the same as in Mexico, except that the mountains rise more abruptly, and in many places the soil is covered with a layer of volcanic ashes. The only rivers of any size in Guatemala to be crossed are the Waranjo, Michatoya and the Rio de los Esclavos.

At Escuintla we connect with the Guatemala Central Railroad. This is a road 71 miles in length, connecting the capital at the coast with San José. Work was begun on the Northern Railroad, which was to reach from the Atlantic coast to Guatemala City, a distance of 225 miles, but the untimely death of General Barrios put a stop to all construction. If the inter-continental road is started this road will undoubtedly be finished. Guatemala exports annually 800,000 cwt. of coffee, mostly to Hamburg and London. Nearly all the coffee is grown on the Pacific slope, and is shipped to Europe via Panama. There are thousands of acres of good coffee land not yet cleared.

From Escuintla to San Salvador, the capital of the republic of the same name, the country is rather more broken. Begining at Acajutla, the character of the coast is changed, and instead of being low and sandy, is abrupt and rocky. This continues into Nicaragua. There is plenty of limestone here, and it makes the finest lime I have ever seen. The Lempa is the only river of any note to be crossed in San Salvador. From Acajutla there is a short piece of railroad running to Sonsonate. The capital is the objective point of this road. San Salvador ships considerable coffee and sugar—all to Europe. A railroad is projected across Hon-




IRON TENDER FRAME.

NEW YORK, LAKE ERIE & WESTERN RAILROAD.

duras from ocean to ocean, and a short piece is now in operation on the Atlantic side, from Puerto Cortez to San Pedro.

After leaving San Salvador and heading the Gulf of Fonseca, the first place of any note is Leon, in Nicaragua. This city is connected by rail, with the port of Corinto. This part of the country is thickly studded with volcanos, and lava is found everywhere. There is little or no rock, and stone for construction will not be over plentiful. Let me warn contractors, who are new to these countries, to look sharp to their classification. There is a great deal of volcanic ashes in different layers, and some of it is very hard. This is classified as *tosca*—at about loose rock prices. Some engineers give hard and soft *tosca*. It makes very fair ballast when gravel cannot be obtained. There is plenty of timber here; in fact the whole route is heavily timbered from Tehuantepec to Panama.

From Leon the route skirts the lakes Managua and Nicaragua, passing through the cities of Managua and Granada—these two places are already connected by rail. Nicaragua is the poorest of all the Central American republics, not raising much of anything but fleas. A branch line into the northeastern part of the Republic would open up an entirely unknown country.

In Costa Rica the mountain range becomes more defined, but the route has only to hug the foot-hills to find level ground. The railroad from Port Limon across the continent to Punta Arenas will soon be completed. There are now three pieces of this road in operation: one from Port Limon to the mountains, one from San Jose toward the Pacific Coast, and one from Punta Arenas to Barranca. Construction is now being pushed on the remainder.

Through Columbia the route must of necessity be nearer the coast, as the continent is getting narrow and the mountains take all the room. There will be found here a few rocky spurs reaching to the coast. From Panama it is a simple matter to connect with Cartagena. Much has already been written of a route from the latter city to connect with the railroad systems of South America, and besides it is time I was drawing my long letter to a close.

One word about the climate. I have lived several years in tropical America, and never suffered as much from the heat as I have in New York City. Sunstrokes are unknown, and the much dreaded fever generally visits those who have made up their minds that they must have it anyhow. The high death rate of Panama is due more to bad whiskey than to any other cause.

I have been over nearly all of the route herein described, and have endeavored to give a plain statement of facts. It is merely a question of time until such a road will be built, and in my opinion it can not be commenced too soon. F. W. C.

CONCORD, N. H., April 10, 1890.

## Iron Tender Frame.

The iron tender frame shown herewith has been in use on the Erie for three or four years past, and has given good satisfaction. It is simple in construction, and the drawings so thoroughly illustrate its design that a detailed description is unnecessary. It will be noticed that the frame is built up of four channel irons running parallel, two being placed at the outer edges of the tank and two in the centre, acting as centre sills. There are two lateral transoms or body bolsters, one over each truck. One of the novel features of this tender frame is the use of diagonal braces, as shown, to hold the frame square. At the corners of the frame are substantial knees for holding the channel irons to the end plates.

The bumper beams are attached by bolts passing through the end sills in the middle of the beam, as shown, and by stays riveted to the channel iron at the sides. The method of mounting the air brake and the arrangement of brake levers is also shown.

Regarding the durability of iron tender frames, there is some doubt, but some roads that have used them for years recommend them highly. A few Western roads are giving attention to this matter, and several new designs will be put in use before long.

## Compound Locomotives.*

Among the advantages claimed for the compound system are:

Facility in starting. The author believes, however, that the contrary may be said in many cases. Nevertheless, French locomotives have valve gears of such design that they readily start their trains, and very soon attain full speed. The inconvenience of sluggishness in starting met with in certain types of locomotives can be avoided; it is a question of gear.

The exhaust pressure being diminished, it results therefrom that sparks are not thrown out. But the same results may be obtained by adopting variable exhaust, which is not uncommon in France, and by giving in every case sufficient section to the blast pipes. Trials have been made on the Orleans Railway with the fixed exhaust of Mr. Wassner, which seems to give good results; the exhaust is into a hollow ring provided with a series of small taps placed round it. The blast, under these conditions, is more regular, and it seems to facilitate the employment of slack coal; it does not make the fuel scatter in the furnace. A good result also follows with the Lencauchez system, which reconveys to the boiler a portion of the exhaust steam, and diminishes the quantity discharged into the atmosphere, thus promoting also economy of fuel. Some goods locomotives on the Paris and Orleans Railway are provided with the Lencauchez apparatus, whereby an economy of 5 per cent., perhaps more, is gained; for passenger locomotives this system has been given up because of its complexity.

If the premiums obtained by engine drivers be taken into consideration for fuel, oil, time saved, overloading, etc., the following differences will be found:

| | Express. Per cent. | Passenger. Per cent. | Merchandise. Per cent. |
|---|---|---|---|
| Depot at Paris | 38.93 | 59.07 | 75.75 |
| " " Orleans | 32.52 | 66.79 | 69.65 |
| " " Tours | 67.54 | 83.52 | 88.00 |
| " " Périgueux | 80.07 | 41.65 | 50.00 |

The results of experience show that stationary compound condensing engines and marine engines are economical; but it does not follow from that that the compound system is advantageous for locomotives. The duty of locomotives is very different from that of other engines, in that their work constantly varies. The compound system is particularly economical where the work to be done is constant, but not otherwise. The author is convinced that there is an economy of fuel with the compound system; but, all other things being equal, he does not think it can exceed 5 to 8 per cent.; now, between a good and an average engine driver the differences far exceed 5 to 8 per cent., reaching even 50 per cent. with a mean of 15 to 20 per cent. In the same way, between a locomotive having its working parts and tires in perfect order, and another on the point of return to the shops after prolonged service, there is a difference of consumption, which often reaches 15 to 30 per cent.; comparing the cost of fuel per 100 kilometric tons gross, there was for the entire network of the Orleans Co. in 1887, 5.86; in 1888, 5.76; or a difference of 2 per cent.

The compound engine diminishes the difficulties due to the wire-drawing of the steam.

The compound engine diminishes condensation and re-evaporation. To compare the influence of condensation in compound engines with that in engines with single cylinders, the result is all in favor of compound engines; but it has been observed that the steam moves so rapidly in the cylinder of locomotives that this is less noticeable than in engines where the speed is less.

The compound engine is the solution of a difficulty felt in countries where fuel is very dear, and under special circumstances; but Watt has said: "In all things, and especially in mechanics, it is necessary to seek sim-

* By Ernest Polonceaux, Chief Locomotive Engineer Orleans Railroad. Abstracted in "Selected Papers," Institution of Civil Engineers.

plicity," and compounding is a complication in the locomotive. High pressures cannot be actually used in locomotives, because of the character of the valve gear, which is not adapted for prolonged expansion. With the compound system the latter can be prolonged further. The compound locomotive would then certainly be theoretically an economical solution; but it would be necessary, as in stationary or marine engines, to be able to give the cylinders the dimensions desired. However, between the frames there is insufficient room.

Practically, the author does not believe that the economy realized makes up for the difficulties of maintenance arising from mechanical complication, and the supplementary expenses of lubrication, even for two-cylinder compound engines; for, despite all precautions, the work is unequal on each side of the engine, and the result is evidently loss of power and dislocations more or less rapid and injurious. The double-expansion compound locomotive is thus not economical. Recourse must therefore be had to the three or four cylinder compound engine; but in that case, in the author's opinion, the economy in fuel will be almost counterbalanced by the increase of expenditure of construction, of lubrication and of maintenance of the machinery. Finally, he might cite the conclusion submitted to the Thirteenth Congress of the Chief Engineers of the Steam-Users' Association, held in Paris on the 11th, 12th and 13th of November, 1888, by Messrs. Coste and Bour:

1. The compound system applied to locomotives has little elasticity, and the normal performance of an engine designed for special conditions of work may became very defective as soon as these conditions are departed from.

2. The compound engine is less adapted to regular work than a single-cylinder engine, when both are applied to variable work.

3. The compound system does not lend itself easily to the performance of dual functions, in the sense that the conditions of work of a condensing engine will differ from those of a non-condensing one. Thus if, in a particular engine, any departure is made from a certain average performance, one or other of such performances is likely to be very defective.

4. Non-condensing compound engines present, in an exaggerated degree, all the defects found in condensing compound engines.

5. The compound engine can hardly be considered an industrial motor, susceptible of being established according to fixed types capable of meeting the general requirements of workshops. Good in certain cases, in others it may give rise to serious disappointment, unless special precautions have been observed. There are, moreover, cases where it ought never to be adopted. The single-cylinder engine, on the contrary, admits of types being established of more general use.

Point 2 applies in a special manner to locomotive engines; and the general result of these conclusions entirely confirms the author's opinion on the application of the compound principle to locomotives.

## Observation on Wind Pressure—Forth Bridge.

The Forth Bridge number of *Engineering* of Feb. 28 gives some interesting information as to the method of investigating the wind pressure at the site of the bridge and the results found. As is well known, the locality is one in which very severe gales are encountered. On three or four days in every year gales blow with such violence as to stop even large paddle boats from attempting to cross the Forth, and on many other days small launches and barges have to keep within shelter. At such times all outside work on the bridge was stopped, owing to the impossibility of handling material by the derrick cranes or getting about on exposed stagings.

The wind pressure to be provided for in the calculations for bridges in exposed positions is 56 lbs. per square foot, according to the Board of Trade regulations, and this twice over the whole area of the girder surface exposed, the resistance to such pressure to be by dead weight in the structure alone. The most violent gales which have occurred in the construction of the Fourth Bridge, with the pressures recorded on wind gauges, are given in the table.

RECORDS OF WIND GAUGES DURING VIOLENT STORMS—FORTH BRIDGE.

| Date. | Pressure in pounds per square foot. | | |
|---|---|---|---|
| | Revolving gauge. | Small fixed gauge. | Large fixed gauge. |
| 1883, Dec. 11 | 33 | 39 | 22 |
| 1884, Jan. 26 | 65 | 41 | 35 |
| 1884, Oct. 27 | 29 | 23 | 18 |
| 1884, Oct. 28 | 26 | 29 | 19 |
| 1885, March 20 | 30 | 25 | 17 |
| 1885, Dec. 4 | 25 | 27 | 19 |
| 1886, March 31 | 26 | 31 | 19 |
| 1887, Feb. 4 | 26 | 11 | 15 |
| 1888, Jan. 5 | 27 | 16 | 7 |
| 1888, Nov. 17 | 35 | 41 | 27 |
| 1889, Nov. 2 | 27 | 34 | 12 |
| 1890, Jan. 19 | 27 | 28 | 16 |
| 1890, Jan. 21 | 26 | 38 | 15 |
| 1890, Jan. 25 | 27 | 24 | 18 |

* These data are unreliable, owing to faulty registration by the indicator needles, as explained. Registers were altered afterwards. The barometer fell to 27.5 in. on that occasion, over ¾ in. within an hour.

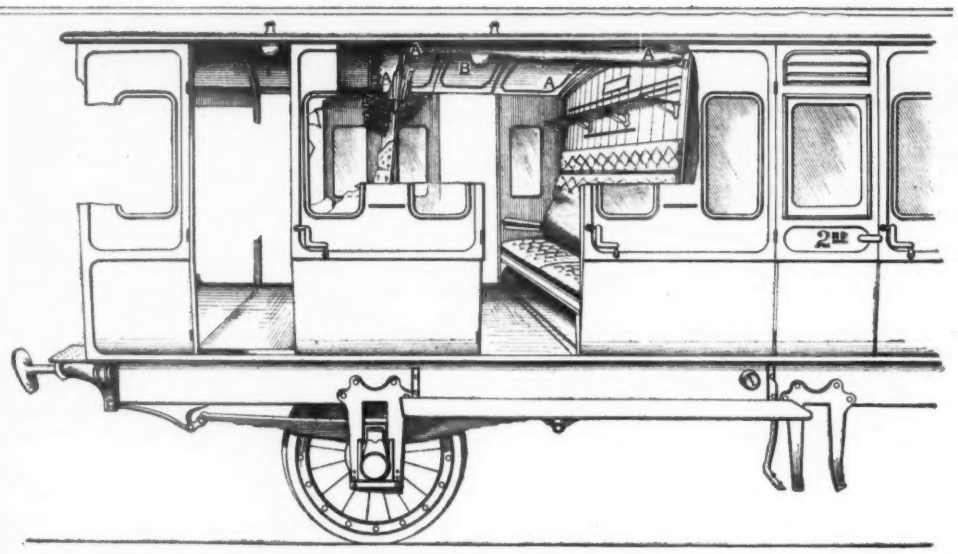
The pressure gauges were put up in the summer of 1882, and daily records have been taken throughout the time elapsed since. The object was to get only the maximum pressures which the structure would eventually have to resist, and the maximum wind pressures on the gauges only were recorded. Two out of the three gauges were fixed to face east and west, as these are the most unfavorable directions from which the wind can strike the bridge. The third gauge was arranged to register for any direction of the wind. The principal gauge was a large board 15 ft. by 20 ft., having 300 square ft. area, set vertically. The board is so hung as to be balanced as nearly as possible, and held at the corners by carefully adjusted spiral springs. Strings lead from the corners of the board to meet in the line of its centre, and are connected to one chord leading to the register.

In order to ascertain to some extent how far great gusts of wind are quite local in their action and exert great pressure only upon a very limited area, two circular spaces, about 18 in. in diameter, one in the exact centre and one in the right-hand top corner, were cut out of the large board, and circular plates with independent registers were inserted.

By the side of this board, about 8 ft. away, a circular plate with an area of 1½ sq. ft. was set up, facing east and west, with an independent registering apparatus. This was intended as a check upon the records given by the large board. The pressures observed by these two gauges are given in the fourth and fifth columns of the table. Another gauge, also with a disk of 1½ sq. ft. area, attached to a vane so that it should face the wind, whatever direction it might come from, was set up and had its own registering apparatus. The third column of the table gives records from this gauge. These gauges were not expected to give very accurate records, but sufficiently so for the purpose for which they were designed. The recorded pressure of 65 lbs. to the square foot was quite obviously due to a defect in the registering apparatus, which was changed immediately, since which time the highest pressures recorded have been 35 lbs., 41 lbs and 27 lbs., respectively, for the three gauges.

A gale on March 31, 1886, gave the following results On the small fixed gauge, 31 lbs.; on the revolving gauge 26 lbs.; in the centre of the large board, 28½ lbs.; in the upper corner of the large board, 22 lbs.; all over the large board, 19 lbs. These figures seem to indicate that the higher wind pressures come more in gusts and sudden squalls than in a steady and even pressure extending over a large area. These conclusions are confirmed by the records made by the two revolving gauges subsequently set up on the central tower after it had been carried up to the full height. The pressures recorded vary as much as 10 lbs. and 12 lbs. on the different piers, sometimes one and sometimes the other showing the higher registration.

In the same issue of *Engineering* is given a very brief account of Sir Benjamin Baker's experiments to determine the wind pressure upon partially protected surfaces. The summing up of his observations may be stated as that in no case was the area affected by the wind in any girder which had two or more surfaces exposed more than 1.8 times the area directly fronting the wind. As the calculations in this particular structure have been made for twice the area fronting the wind the stresses which the structure will receive from this cause will be in all cases less than those provided for.




EFFECTS OF TELESCOPING ENGLISH CARRIAGES.

## An English Accident.

The accompanying illustration shows the condition of an English railroad carriage after an end collision. It was sent to us by an officer of the Lancashire & York shire Railway. The collision was between a heavily laden passenger train and a freight train. The most notable feature of the wreck was the telescoping of two carriages, as shown in the illustration.

The doors and part of the side of the second class carriage are removed in the sketch to show the interior. A portion of the roof of the first class carriage, *A A*, is shown driven far into the second class carriage. The first class carriage was completely demolished, with the exception of one compartment. It will be noticed that the portion of the roof cut through the end of the car and the partition of the first compartment without breaking the glass globe *B* of the lamp attached to it. Fortunately but five persons were injured, none of them seriously, and no one was killed.

## Plate and Lattice Girders, with Special Reference to Elevated Railroads.

What are the comparative merits of plate and lattice girders? The dispute over the merits of lattice and pin connected spans will probably last as long as any difference of opinion exists between men in general, but that comparison does not enter in where what may be properly called small spans are considered; but in the case of small spans, say between 30 ft. and 100 ft., especially for the construction of elevated railroads, the question is an important one, influencing to a greater or less degree the question of light, noise, and economy, which includes relative cost, permanency, and general rigidity.

The question of light will be discussed hereafter. As to noise, the primary cause of the sound is the most important feature to be considered. On Greenwich street, in New York City, the greater part of the noise has been due to defective rail joints, over which every wheel bumped with a noise like a trip hammer, accompanied by additional rattling. Aside from noise of the joints, which can undoubtedly be corrected, the noise of the elevated railroad is a steady rumble, less annoying than the rattle of teams over any of the granite pavements of the streets.

I believe that no engineer will dispute the opinion that a plate girder, within certain limits of span, is the most rigid and lasting of any form of girder. The girder having a web of one piece and the flange pieces of full length of span is well within those limits, and it is probable you cannot improve on the rigidity of a girder so long as you can avoid horizontal joints in the web. I say horizontal, because that implies vertical joints at the same time, for it is only after the limit at which vertical joints must be used that it is necessary to resort to horizontal joints. There is on the Pennsylvania Railroad an 80 ft. span plate girder bridge under four tracks, over which the cars pass at a speed of 60, and not infrequently as great as 70 miles per hour.

Other roads are now building 100-ft. span plate girders with only vertical joints in the web, the flanges being necessarily spliced, though as some of the rail mills are now rolling rails 120 or may be 150 ft. long, we could probably get angles as long if it was very desirable. The simplicity of construction makes a plate girder cheaper, even where the weight may be within limits greater than a lattice or truss girder of any kind. What those limits of weight are will depend on the span, and frequently on the conditions of location. Nor is the cheapest always the most economical.

While we cannot know with any certainty just the action of the rivets in transferring the web strains to the flanges of a plate girder, we do know in a lattice girder the exact number of rivets necessary to connect a web member with the flange, and that the loss of a single one of those rivets, would seriously impair the value of that member, while the omission at intervals of a number of the rivets connecting the web and flange of a plate girder, while objectionable, would not be serious except at or near the ends or points of support. It may be seriously asked concerning the girders of the Manhattan Elevated, notably on Pearl street, since the new web plates have been put in, is there not now actually more iron, more expensive and less useful, than there would be in a single web plate? It would seem hardly fair to compare girders that have been patched as those have with a new girder designed to carry the load, yet those girders were patched to meet the additional strain, and with probably as little material as could be used.

The necessary omission of lateral or longitudinal bearing between the columns of an elevated railroad in the street obliges us to seek for stiffness either in the bedding of the columns or the girders, and their connections with the columns at the top or both. If the column is carried to the top of the girder the rigidity of the structure will depend on the stiffness of both the columns and the girder, assisted by the wooden guard rails, especially at the points where an expansion joint is necessary, and laterally the connection with the column may be firmly riveted and assisted by a bracket. I believe that with plate girders and columns and a liberal factor of safety, even merging on extravagance (if it can at all be considered so), an elevated

structure can be made that will not only be safer than running on the ground, but far more agreeable, due to the elasticity of the structure and open airiness of the position.

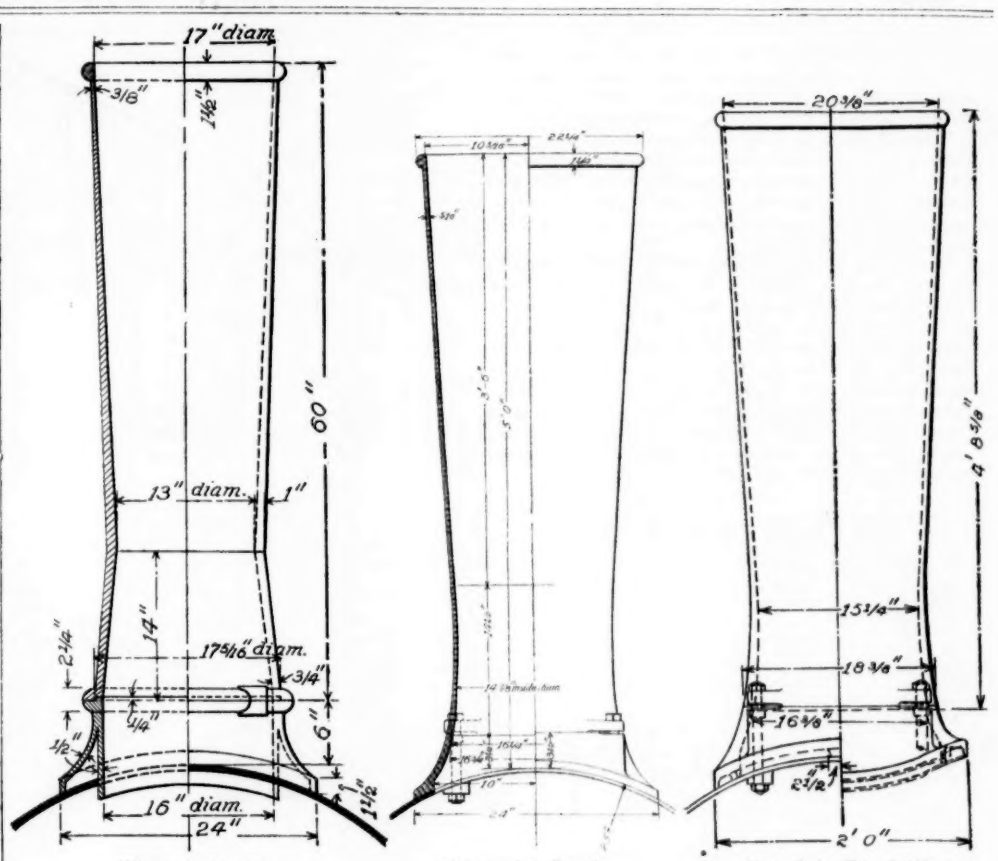
C. J. BATES.

## Cast-Iron Smoke Stacks.

We present herewith three drawings of cast-iron smoke stacks which are at present being used with considerable success. The shape and form of the stacks are not particularly novel, as for some years past stacks with restricted openings at the throat have been used with much success, but made principally of wrought iron or steel. The novelty in these stacks lies greatly in the variations in thickness, which is well worth consideration, because if the lighter stacks are sufficiently strong and durable, the saving in weight due to their use is desirable.

On the Midland Railway and several other English roads cast-iron stacks about ¼ in. in thickness have been adopted as a standard. There is no question but that cast iron is more durable than sheet iron or steel for smoke stacks, and several roads in this country have been using such stacks with gratifying success.

There is a noticeable difference in the diameter of the stack at the throat or at the restricted portion. For instance, the Erie stack is 15⅝ inches inside for all classes of engines. The Wisconsin Central is 13 inches. The Richmond & Danville is 14⅜ inches for 20-inch cylinders, and 13 inches for 16 and 17 inch cylinders. However, this dimension depends largely upon the diameter and location of the exhaust nozzle, the work demanded from the engine, and the draft required to blow the fires. It is not to be expected, as believed by some, that the same sized stack is exactly right for locomotives with differing dimensions, but it is highly probable that the variation required to best suit the conditions brought about by different diameter of the cylinders is very small indeed, and, therefore, that a standard diameter which approximates closely to the average of the different best diameters meets the requirements near enough to prevent any noticeable effect with engines of different sizes.




Wisconsin Central. Richmond & Danville. New York, Lake Erie & Western.

CAST-IRON SMOKE STACKS.

## Standard Track Fence—Pennsylvania Railroad.

The drawings printed herewith show details of the Standard Fence used by the Pennsylvania Railroad between main tracks at way stations. The peculiarity of the fence is the arrangement of fastenings, by which all but the posts can be removed at will when track repairing or other work makes it desirable to do so. As will

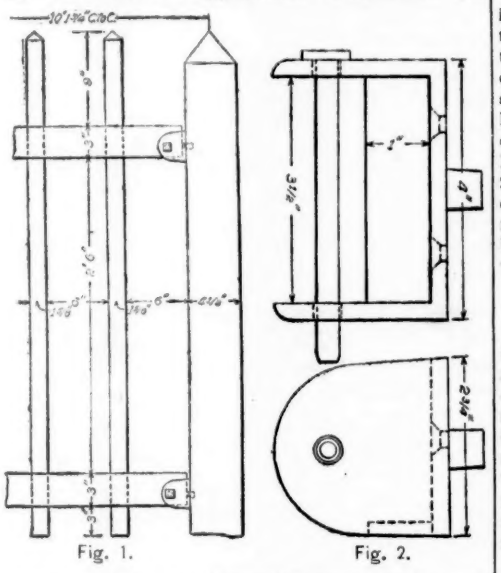


Fig. 1. Fig. 2.

be seen by fig. 1 the horizontal rails, both top and bottom, rest in cast-iron sockets, which are fastened to the posts by two screws, and are further held in place by lugs set into the post. Fig. 2 shows a plan of this socket on a larger scale, and beneath it a side elevation.

## Block Signals in France.

The readers of the *Railroad Gazette* will remember that we gave in the issues of Feb. 21 and March 7 an interesting account of a variety of electric signals and other applications of electricity on the Northern Railroad of France. In reply to inquiries from us concerning further details of the system of block signaling in use on that road, we have received a letter from one of the officers of the company giving additional facts of interest. We give below some extracts from this letter:

"There is no automatic block signal system, actuated by the wheels of passing cars, in use on the Northern Railroad of France. The block system employed by that company is the Lartigue. This is operated by hand as the trains pass the various signals, there being a man at each. The number of these semaphore posts is about 515, distributed over a length of 975 kilometres of double track. We have, however, on the Northern of France an electric device attached to the passenger engines, by means of which a contact is made with what is called a 'crocodile,' fixed in the track and electrically connected with a distant signal. Contact with the crocodile applies the vacuum brake on the engine if the distant signal is at danger. The circuit between the engine and the fixed contact is made by means of a little copper brush carried by the engine. There are in service 700 locomotives* with this attachment, and 1,000 distant signals are provided with the crocodile apparatus.

"The Paris, Lyons & Mediterranean is the only road in France which employs automatic [visual] signals actuated by the wheels. In the system there used the distant signals (but not the home) are automatically put to danger by the passage of the train, but cannot be restored to safety except by hand. These are disk signals, known as the Aubine automatic signals, and about 728 of them are in use. Besides these the Paris, Lyons & Mediterranean has 636 block signals, distributed over 2,067 kilometres of double line. An engineer of that company has designed a block system entirely automatic, which was shown at the Paris exhibition of 1889, but has not been put in actual service. It seems to me very ingenious."

## Our Lake Marine.

It is generally known that the tonnage passing through the "Soo" Canal is now greater than that passing through the Suez Canal, and it has for some time been claimed that a greater tonnage passes Detroit than any other point in the world; but until the publication of the Inland Lloyd's Register the facts as to actual tonnage on the lakes and its value have not been known. The figures presented will excite surprise, showing 1,974 craft with an aggregate tonnnge of 764,572 net measurement, valued for insurance purposes at $50,200,800.

The *Marine Review*, of Cleveland, thinks that this valuation is about 10 per cent. too high, which is offset, however, by the low grade tonnage not included in the classification. The number, tonnage and valuation is as given below:

| Class. | Number. | Net tons. | Valuation. |
|---|---|---|---|
| Sidewheel | 41 | 15,994 | $1,897,000 |
| Propellers | 580 | 436,613 | 36,438,100 |
| Sail and consort | 906 | 299,608 | 9,204,760 |
| Tugs | 437 | 12,357 | 2,660,950 |
| Totals | 1,974 | 764,572 | $50,200,800 |

This does not include the Canadian vessels, which would make a noticeable addition to the available capacity. To arrive at the gross tonnage of the fleet it will probably be perfectly safe to add 30 per cent. to the 464,964 tons of steamers and 5 per cent. to the 299,608 tons of sailing vessels, giving an aggregate of 919,041 tons.

More than half of this value has been added during the past four seasons, as appears from a table in the *Review*, which unfortunately as a matter of comparison gives the capacity in gross tons instead of the net tonnage.

LAKE CRAFT BUILT, BY SEASONS.

| Winter of | Number of boats. | Capacity, gross tons. | Valuation |
|---|---|---|---|
| 1886-87 | 31 | 65,750 | $4,074,000 |
| 1887-88 | 60 | 108,525 | 8,325,000 |
| 1888-89 | 59 | 100,950 | 7,124,000 |
| 1889-90 | 56 | 124,750 | 7,866,000 |
| Totals | 206 | 399,975 | $27,389,000 |

In the meantime there seems to be no material slackening in building, though orders were rather dull during the early part of winter. But it now seems that the fleet will have full occupation during the season unless there should be labor troubles to interfere with the expected output of ore, and it is probable that the tonnage built during the season of 1890-91 will fully equal that of the present season.

If the proposed bill for a canal around the Niagara Falls on the American side, with locks as large as those at the "Soo," should pass, it would probably result in one or more yards being established on Lake Ontario; an establishment which would be justified by the increase both in tonnage and ton-mileage which would result from such a material increase in the available length of our great waterway.

* Erroneously given as 89 in our previous article.

## Altoona Truck Shop of the Pennsylvania Railroad.

As illustrating some of the points that we have lately discussed as to good shop arrangement, we show herewith plans of the new truck shop of the Pennsylvania Railroad at Altoona.

This shop has been some time developing to its present efficiency, and is the outcome of much study and investigation as well as practical experiment on the part of the mechanical officers of the Pennsylvania. The following table and the cuts show the location of the machinery, and of the parts of trucks while under construction. The letters in the table refer to corresponding letters in the plans of the different bays.

The progress of the material in this shop from what is practically raw material to a completed truck is clearly shown. The route of each part from its entrance to its destination on the completed truck is such as to require a minimum of handling and the least possible interference with other details.

The dimensions of the building and the location of the tracks can be seen from the illustrations, of which fig. 3 shows the plan of the shop, with the location of all the machinery and the details for turning out 60 trucks per day. The machines are supplied with lubricant for the cutting tools from a tank located just under the roof above the drill press $A^1$. The lubricant flows by gravity to the different machines, and is drained away by a system of drains under the floor to a tank, also under the floor, at the corner under the drill presses, and thence it is pumped to the tank under the roof.

Fig. 4 shows the design of roof truss and the system of heating. Fig. 5 shows the system of heating along the side of the building and the location of the windows and ventilators, also the location of the bays of the roof trusses. Fig. 1 illustrates the method of hanging the shafting and the arrangement of belting. The main shaft travels at 135 revolutions per minute. Fig. 2 shows the location of the differential pulley blocks and the runs for the trolleys, of which there are three, located over the centres of the trucks, with two blocks on each, and one tramway located along the side, with one block on each. A detail of the tramway is shown in fig. 7. The external appearance of the building is given in fig. 6, in which are shown the arrangement of the windows and doors and the sizes of the glass used.

The shop is heated by exhaust steam from the engine,

which is driven into the 6-in. heating pipe shown under the roof, and thence passes outward to the coil heaters under the windows. No live steam is used. The shop is lighted by electric arc lamps, five being sufficient.

When 60 trucks are being built per day, six trucks are erected at one time, 24 men being employed for erecting purposes; that is, four men to each truck. The total number of men employed in the shop is about 44, and the actual cost of labor on the trucks is not far from $1.50 by a careful estimate.

A new wheel and axle shop of the same dimensions as the truck shop is soon to be erected, with 200 ft. between it and the shop here illustrated. It will contain 12 axle lathes and 12 wheel borers. As the ground slopes from the proposed wheel and axle shop to the truck shop, the wheels will roll by gravity into position for erection in the truck shop, which will save much of the labor of transportation now necessary. The saving of time brought about by the method followed in this truck shop will be equaled, it is expected, by the method to be followed in the new wheel and axle shop.

*First Bay.*

*A*—Top and bottom bars.
*A*[1]—6-spindle drill press for top and bottom bars.
*A*[2]—8-spindle " " " " " "
*B*—Grindstone.
*C*—Swing bolsters.
*D*—Truss blocks.
*E*—Truss rod caps.
*F*—Centre plates.
*G*—Swing bolsters.
*H*—Erecting floor for swing bolsters.
*J*—Drill press for journal boxes.
*K*—Journal boxes.
*L*—Grinder for journal boxes, double-header.
*M*—Journal boxes.
*N*—Drinking and wash water.

*Second Bay.*

*A*—Brake beams, dust guards and spring seat filling.
*B*—Brake beam erecting floor.
*C*—Brake beam details.
*D*—Finished brake beams.
*E*—Brake heads.
*F*—Brake shoes and safety guards.
*G*—Journal bearings, arch bar bolts and other bolts.
*H*—Top arch bars.
*J*—Bolster springs.
*K*—Journal boxes, bottom bars and journal bearings.
*L*—Brake levers, journal boxes, bolster springs and journal bearings.
*M*—Bottom arch bars.
*N*—Journal brasses.
*O*—Fitting up bench for journal boxes.

*Third Bay.*

*A*—Stationary engine.
*B*—Spring seats.
*C*—3-spindle drill for spring seats.
*D*—Spring seats.
*E*—Tool bench.
*F*—Journal bearings and springs.
*G*—Brake lever guides.
*H*—Springs.
*J*—Brake rods.
*K*—Brake hanger bearings.
*L*—Brake levers.
*M*—Side bearing.
*N*—Top arch bars.
*O*—Truck transoms—riveted up.
*P*—Fitting up bench for dust guards.

*Fourth Bay.*

*A*—16-spindle drill for flanges of channel iron transoms.
*B*—Transom not drilled.
*C*—8-spindle drill press for webs of transom.
*D*—Transoms drilled.
*E*—Tool grinder.
*F*—Office.
*G*—Stationary riveter.
*H*—Rivet heater.
*J*—Portable riveter traveling over benches.
*K*—Rivet bins.
*L*—Spring seats.
*M*—Iron flanges for holding transoms for riveting.
*N*—Spring seats.
*O*—Hydraulic accumulator.

The following is a list of tools in the shop:

One 6-spindle drill for arch bars.
One 8-spindle drill for arch bars.
One grindstone.
One drill press for journal boxes.
One double-headed grinder for journal boxes.
One stationary engine.
One 3-spindle drill for spring seats.
One stationary hydraulic riveter.
One portable hydraulic riveter.
One stationary jib crane.
One 18-spindle drill press.
One 18-spindle drill press for flanges of channel bars.
One 8-spindle drill press for webs of channel bars.
One Universal tool-grinder.
One rivet heater.
One hydraulic accumulator.
One pump for lubricant.
One Yale & Towne hand-traveling crane.
Nine 1-ton differential pulley blocks.
Seven 1-ton trolleys for tramways.

## TECHNICAL.

### Manufacturing and Business.

The Niles Tool Works of Hamilton, O., have received an order for the tools for the new shops of the Columbus, Hocking Valley & Toledo, at Columbus, O., being built to replace the building destroyed by fire.

The Ross-Meehan Brake Shoe Co., of Chattanooga, has an order from the Cincinnati, New Orleans & Texas Pacific for two turn-tables.

The new station of the Grand Rapids & Indiana road at Grand Rapids, and the new dock sheds of the Chesapeake & Ohio at Newport News, Va., will be supplied with sky lights by Josephus Plenty, of 71 Broadway, New York.

The Wisconsin Central has ordered the Elmore box lid for 1,000 cars.

The Morgan Engineering Co., of Alliance, O., is building a hydraulic flanging machine and a side flanging machine for Riter & Conley, of Pittsburgh. The side flanging machine will flange a plate 11 ft. in diameter and 1¼ in. thick.

The following companies have been incorporated in Illinois: Chicago Car Trust, of Chicago, to purchase and lease railroad equipment. The capital stock is $10,000. John Farson, A. E. Bradley and Charles Lane are the incorporators. Southern Construction Co., of East St. Louis, with a capital stock of $500,000, to build railroads in the southern states. The incorporators are B. F. Johnson, William S. Carter and Joseph Dickson.

The American Supply Company, of Kansas City, Mo., reports a number of sales as follows: 10 cars of black powder for railroad work in Utah; 20 box, 10 platform and 10 gondola cars to the New Orleans & Northwestern; 1,000 tons of rails and fastenings to the Ft. Smith & Texarkana, and 400 tons of rails and fastenings to Wm. B. Knight, of Kansas City, for Augusta, Ga.

### Iron and Steel.

The Leechburg Foundry & Machine Co. has an order from the Columbia Rolling Mill Co., of Columbia, Pa., for a 30-ton fly-wheel and an 18-in. hammered wrought-iron shaft.

The Nova Scotia Steel & Forge Co., of New Glasgow, N. S., has been merged into the Nova Scotia Steel & Iron Co., with a capital of $2,000,000 and a debenture capital of $600,000. The company has been formed for the purpose of extending the present business and assuming the franchises and other properties of the New Glasgow Iron, Coal & Railway Co., and to erect blast furnaces and manufacture iron and steel. Frank Ross, of Quebec, is a director.

It is reported that the Tudor Iron Works, of East St.

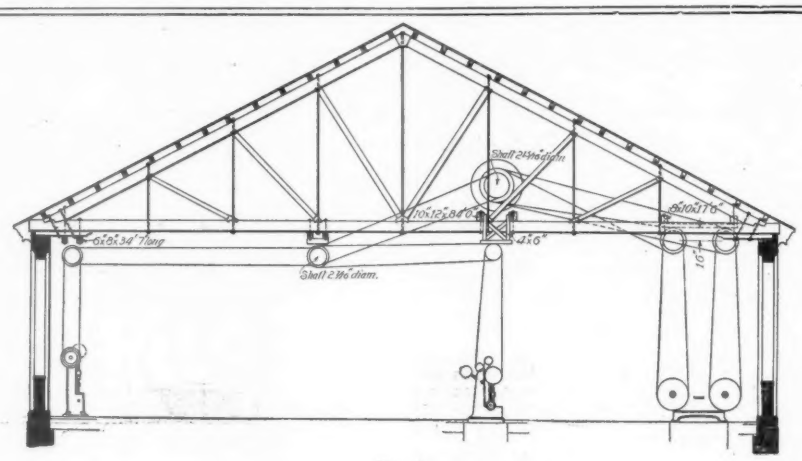



Fig. 1.

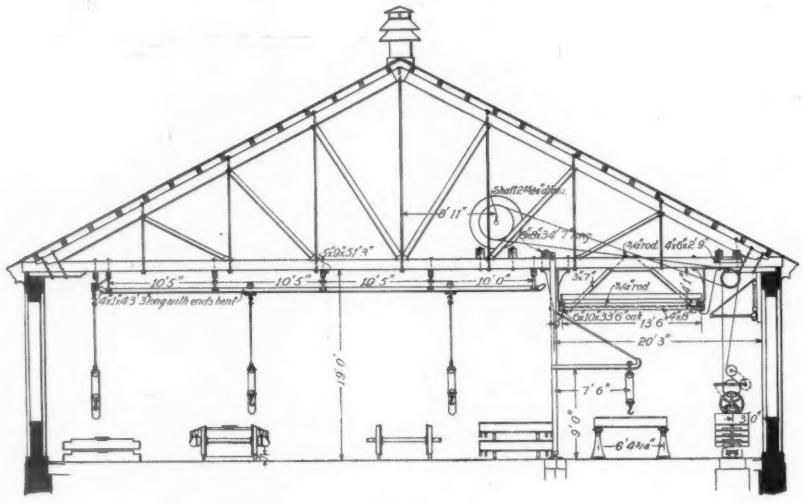



Fig. 2.

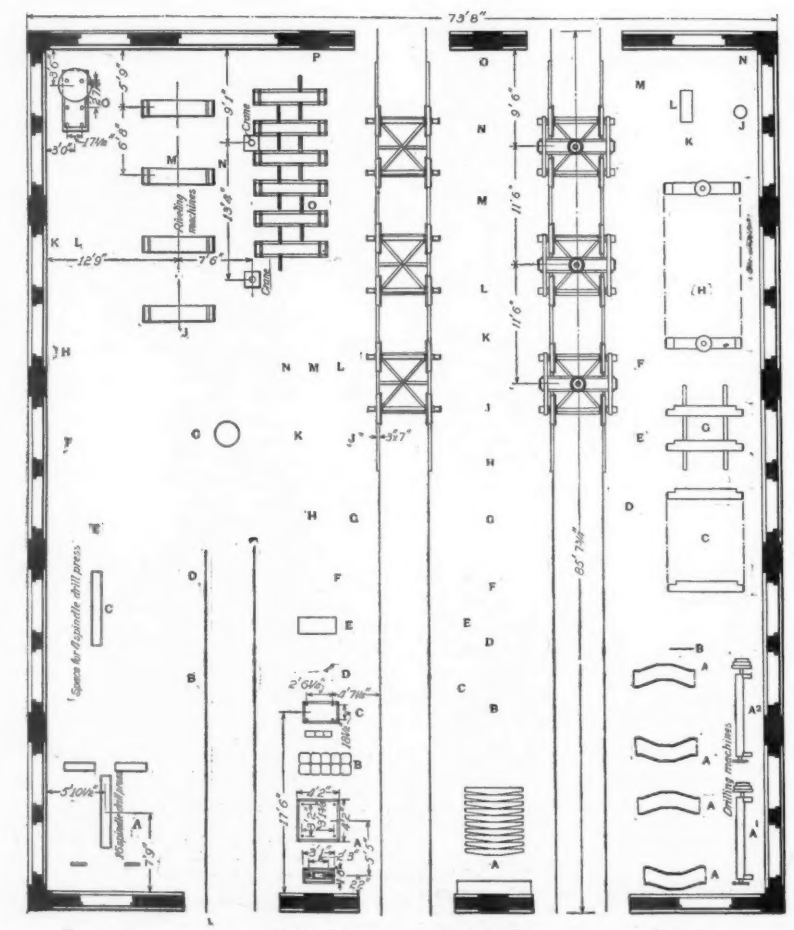



Fig. 3.

ALTOONA TRUCK SHOP—PENNSYLVANIA RAILROAD.

Louis, Ill., have purchased the Waugh Nail & Steel Works, at Belleville, Ill., and that these will be consolidated with the Western Nail Works and the Valley Steel & Forge Co., which are now controlled by the Tudor Company.

James P. Witherow, of Pittsburgh, has the contract for erecting the blast furnace of the Bristol Iron & Steel Co. at Bristol, Tenn.

Clinton Furnace of the Clinton Iron & Steel Co., at Pittsburgh, which is being rebuilt, will be ready for blast this month. The furnace has been improved and enlarged and will turn out about 100 tons per day when in operation.

The West Superior Iron & Steel Co., of West Superior, Wis., will build a Bessemer works and a rolling mill for steel plates beams and structural shapes.

### The Rail Market.

*Steel Rails.*—A Southwestern road has bought 5,000 tons at Pittsburgh at private terms. Few other sales are reported, and the market is weak, and the quotations have been shaded by many of the mills. The prices quoted are: In the East, $33.50@$34 for desirable orders, and at Pittsburgh, $33@$34 cash.

*Old Rails.*—There is little business, and quotations are nominally $23.50@$24 for tees in the East; $23.50@$24 for old iron rails at Pittsburgh, and $22.50 for old iron rails, and $20.50@$21 for old steel rails at Chicago.

### Car Heating.

A circular letter has been issued by Mr. George Westinghouse, Jr., concerning the sale to the Consolidated Car Heating Co. of the business and patents of the Standard. He says: "It is conceded that the warming of railroad cars by steam generated in the locomotive has become more than an experiment; but to become universal, uniform apparatus and practice will be necessary on all connecting lines. As regards the use of like apparatus on all lines, the arguments which have heretofore prevailed with reference to brake apparatus can be equally well advanced in favor of uniformity in steam-heating apparatus, and this uniformity in steam-heating apparatus will, as has been the case with brakes, be much more likely to result from the concentration of the business in the hands of one concern than in any other way; indeed the little progress so far made in fitting cars has been due to the difficulties arising from the use of dissimilar systems. After careful investigation, I became convinced that the Consolidated is far in advance of all other companies in the completeness of its several systems and the scope and strength of its patents.

"The commingler system, it seems to me, most nearly solves the problem of car-heating. The system involves the use, within the car, of pipes containing water, with which steam is noiselessly commingled through an ingenious device which has the effect of quickly heating and circulating the water, and admits of the utilization of a great part of the latent (stored) heat, which is necessarily wasted in all direct steam systems, and secures the regulation of the temperature of the water from 70 degrees up to whatever is required for the coldest weather, thus making it possible to avoid the annoyance and discomfort which result from the use of those systems whereby the steam is admitted directly into the pipes at not less than 212 degrees. The pipes of the commingler system may be used without an auxiliary water heater, or they may be connected to a coil within a stove, so that fire may be applied and the circulation and heat kept up when the car is disconnected from the locomotive; although the heat ordinarily contained in this considerable body of water will suffice for maintaining a fair temperature within a car for some time after the steam from the engine has been turned off."

### The East River Tunnel.

The New York & Long Island Railroad Co. has prepared plans for a tunnel under the East River and under Forty-second street in New York, to connect the Long Island Railroad with the N. Y. C. & H. R. The consent of all the property holders along Forty-second street has been obtained, together with the consent of the Long Island City property holders and of the Board of Aldermen in that city. The only thing lacking is the consent of the Board of Aldermen in New York. There have been several hearings of the case, a recent one having been called to hear the opponents to the scheme, when no one appeared. Another hearing was had Wednesday of this week, and still another is set for April 30. Should the decision of the board be favorable, work will be commenced at once. The tunnel is to have passenger elevators at both ends.

## THE SCRAP HEAP.

### Notes.

Twenty-seven workmen were injured by the derailment of a train at Frankfort, Germany, April 9.

The St. Louis, Vandalia & Terre Haute is putting in throw-off switches at the ends of all its side tracks.

The coal pockets at Honesdale, Pa., owned by the Delaware & Hudson Canal Co., were destroyed on Monday by fire, together with 25 loaded cars and 2,000 tons of coal in the chutes. The pockets were about 900 ft. long.

A jury in Boston has rendered a verdict of $18,000 against the Boston & Albany in favor of Joseph W. Sweat, a brakeman, who was thrown from a car and lost an arm at Framingham Sept. 6, 1887. The platform of the car on which he was standing was defective.

A man was arrested at Park Junction, Philadelphia, last week for entering freight cars of the Philadelphia & Reading for the purpose of taking names of consignors and consignees as marked on the packages. It is claimed that the culprit was an emissary of a competing road. He was fined $10.50 and dismissed on promising to go and sin no more.

Committees of the engineers and firemen of the Northern Pacific have been in St. Paul for three weeks negotiating with the officers of that road concerning various grievances. The only complaints they divulge to the reporters are concerning alleged mismanagement of the railroad company's hospital at Brainerd and the discharge of an engineer for refusing to make a flying switch when the Master Mechanic ordered him to do so. The Chicago, St. Paul, Minneapolis & Omaha has granted the request of its freight conductors and brakemen for an increase of pay to $3 and $2 per day respectively. The Delaware & Hudson Canal Co. has increased the pay of passenger conductors, making them uniformly $95 per month. The employés of this road are to be paid semi-monthly. Freight traffic was virtually suspended for three days on the St. Louis Division of the Mobile & Ohio by a strike of brakemen. The difficulty was in consequence of an order that freights must run only 10 miles an hour. It was finally settled by an agreement under which the men are paid 2.64 cents a mile, and paid for extra time over 12 hours. The rate of speed is not to be reduced from the former standard. Eight passenger conductors have been discharged by the Cincinnati, New Orleans & Texas Pacific.

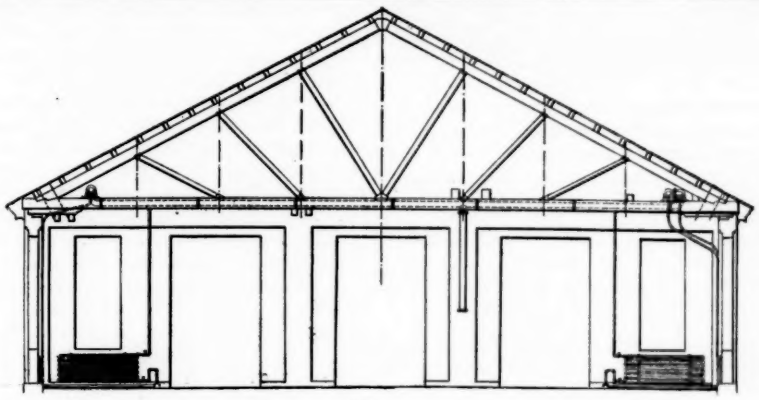


Fig. 4.

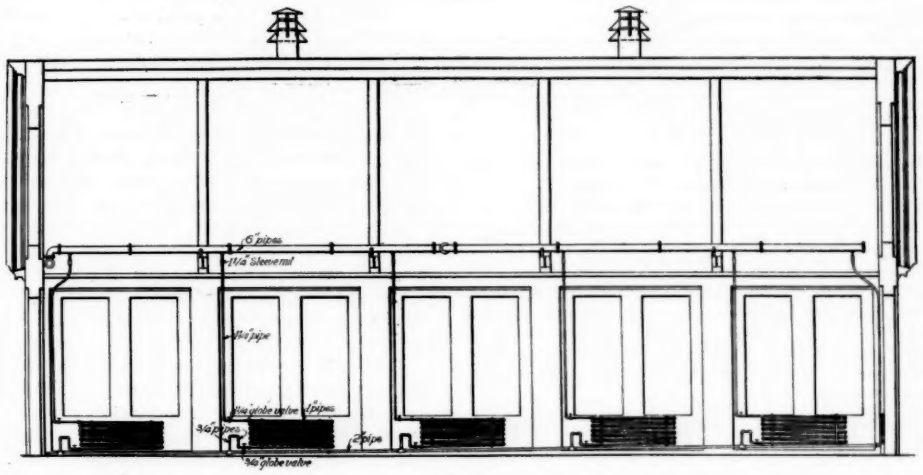



Fig. 5.

Fig. 6.

Detail of Tramway.

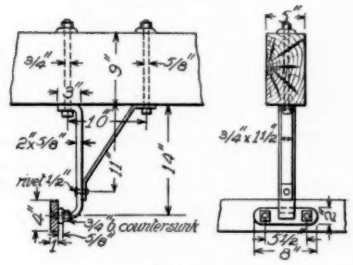



Fig. 7.

ALTOONA TRUCK SHOPS—PENNSYLVANIA RAILROAD.

### Machine-Made Wit.

Doctor (after the railroad accident)—Are you much hurt?

Railroad official (faintly)—I must positively decline to furnish any information.

### A Steamer Runs Into a Railroad Bridge.

The steamer "Handy Boy," of the Bay Line River steamers, running on the Saginaw River between Saginaw and Bay City, on Sunday afternoon, April 13, ran into the Flint & Pere Marquette Railroad bridge, carrying away all her upper works and sweeping most of the passengers into the river. Six or more were drowned. The steamer was 60 ft. west of her proper course in the channel. Carelessness on the part of an inexperinced pilot is given as the cause of the accident.

### The "Young Napoleons" of the Passenger Business.

The Kansas Railroad Commission has rendered a decision on the petition of the citizens of Wilson, Montgomery and Chautauqua counties against the Missouri Pacific, ordering the latter to restore passenger service on the Le Roy & Caney Valley Air Line Railroad, of which the respondent company is lessee. The Board directs that such service be supplied by May 1, and in concluding its summing up of the case, says: "We cannot be blind to the fact that railroad managements do not always, even when practicable to do so, confine their passenger service strictly to the limits of public requirements and the production of self-sustaining revenue. Even now, while the dwellers upon the prairies, who have voluntarily taxed themselves to supply decent railroad facilities, are protesting against being hauled about at the rear end of freight trains, and their protest is met with the plea that better facilities cannot be afforded, tens of thousands of dollars of revenue are being wasted by railroad companies operating in this territory, in what is curiously called a passenger war, which young men who are set to conduct passenger traffic indulge in when they get tired of baseball, and who ought to be sent to Jericho until their beards have grown, and sober-minded men put in charge. If this were done railroad companies could afford to give people on the prairies a chance; or at any rate, the plea that it does not pay would come with more impressive grace."

### The New Tariff Bill.

The Ways and Means Committee of the House has reported its Tariff Bill. In the metal schedule no change of duty has been recommended upon iron ore or iron in pigs. These duties, it is believed, cannot be lowered without detriment to existing industries, and the committee has not felt justified in interfering with the further development of the iron ore resources, now so promising, in the Southern States. The committee have recommended among others the following changes: Bar-iron, not less than three-quarters of an inch square, has been reduced from 1 cent to nine-tenths of a cent per pound; square iron less than three-quarters of an inch, from 1.1 to 1 cent per pound; and round iron in coils or rods, less than seven-sixteenths of 1 inch in diameter, and bars or shapes of rolled iron, not especially provided for in this act, from 1.2 to 1.1 cents per pound. Beams, girders, joists, angles, channels, hinged columns, and posts, or sections thereof in building form, are reduced from 1¼ to nine-tenths of 1 cent per pound. Railroad iron is reduced from $17 per ton to $13.44 per ton. Railroad fish-plates, or splice-bars, are reduced from 1¼ to 1 cent per pound. Iron and steel sheets, common or black, and known as taggers iron or steel, has been reduced throughout one-tenth of 1 cent per pound. In wires of all description there has been a reduction of one-fourth of 1 cent per pound. Axles, or parts thereof, of iron or steel, are reduced from 2⅛ to 2 cents per pound. Boiler or other tubes, from 3 to 2¼ cents per pound. Bolts, nuts, and finished hinges and hinge-blanks, from 2¼ to 2¼ cents per pound. Cast-iron pipe of every description, from 1 cent to nine-tenths of a cent per pound. Castings of malleable iron, from 2 cents to 1¾ cents per pound. Chains of all kinds, made of iron or steel, have been reduced from 2 cents to 1.8 cents per ponnd.

RAILROAD GAZETTE

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## EDITORIAL ANNOUNCEMENTS.

**Contributions.**—*Subscribers and others will materially assist us in making our news accurate and complete if they will send us early information of events which take place under their observation, such as changes in railroad officers, organizations and changes of companies the letting, progress and completion of contracts for new works or important improvements of old ones, experiments in the construction of roads and machinery and in their management, particulars as to the business of railroads, and suggestions as to its improvement. Discussions of subjects pertaining to* ALL DEPARTMENTS *of railroad business by men practically acquainted with them are especially desired. Officers will oblige us by forwarding early copies of notices of meetings, elections, appointments, and especially annual reports, some notice of all of which will be published.*

**Advertisements.**—*We wish it distinctly understood that we will entertain no proposition to publish anything in this journal for pay,* EXCEPT IN THE ADVERTISING COLUMNS. *We give in our editorial columns* OUR OWN *opinions, and those only, and in our news columns present only such matter as we consider interesting, and important to our readers. Those who wish to recommend their inventions, machinery, supplies, financial schemes, etc., to our readers can do so fully in our advertising columns, but it is useless to ask us to recommend them editorially, either for money or in consideration of advertising patronage.*

An investigation of the dressed beef industry shows that the combination is making enormous profits. If the Senate, before assenting to the law against pooling, had investigated railroad combinations to see if they were making enormous profits, it would have been a wise thing. At present the railroads are at a disadvantage in dealing with any industry which is thoroughly pooled. Free competition may be a good thing; one-sided free competition certainly is not. As matters stand to-day, a combination of shippers, by threatening to throw all the business of a certain class on to one road, can dictate terms to the other roads. The railroads are charged with the public duty of maintaining fair rates; yet shippers are allowed to combine to procure unfair ones, and railroads are forbidden to protect themselves by similar combinations. Such is the state of things under the pooling clause.

The Altoona truck shop described in this issue is remarkable because of the large product from a comparatively small area, and no doubt the plans will be carefully studied by those who are interested in shops for similar work. It will be noticed that this shop has a capacity for erecting complete 60 trucks per day with 44 men, 24 of whom are employed in erecting—that is, four men to each truck, there being six trucks erected at one time. Therefore, but 100 sq. ft. of floor space is necessary for the erection of one truck per day, which is a remarkably small area for the work done. It means only an average space 10 ft. square, including room for all tools and storage. Of course, in a small shop of less capacity this average area would not be sufficient; but in a larger shop, equally well arranged and of greater capacity, it might be reduced. If this is compared with the practice in many truck shops, even those belonging to particularly successful car companies, it will be found that the output is highly creditable, especially as this space answers for storage, and the trucks are iron trucks of one of the most approved designs. The number of men employed per truck is about 0.73, working ten hours, which includes almost the entire finishing of every detail excepting the wheels and axles. The cost of labor per truck, including wheels and axles, already very low, will be further reduced as soon as the new wheel and axle shop is finished. The location of tools in the latter shop will also be a matter of interest to those who study economical production.

The killing of persons walking on the track has become such a serious matter at some points on the New York Central & Hudson River that the company has been compelled to take radical action, and the chief detective of the road and his assistants have been instructed to cause the arrest of every person found trespassing on the tracks. We do not understand that the company's detective force can cover the whole road at once, but on a section of about 10 miles on the Hudson River Division, between Low Point and Breakneck Tunnel, where there are a number of brick yards near the line of the road, it is said that 18 persons have been killed within the last 15 months; here the trespassers will be closely looked after. The interviews with the detectives published in the local papers reiterate the old complaint that local magistrates will not give proper aid in the conviction of men found illegally walking on the track; but it appears that the company is determined to do its full duty in the matter. It would be well if many other roads would take equally vigorous action. Even on the low moral plane of the fireman who dreaded to run over a man "because it mussed up the engine so," railroads should strive to reduce the death lists. Some of their money could in this way be used to educate public opinion by forcing derelict magistrates to rightly administer the laws, and it would be a kind of education perhaps fully as profitable as those kinds which railroad money is supposed to often go for. Some of the state railroad commissions print lists of casualties in which those on a single road cover several pages. It would lighten a black cloud if this record could be shortened.

The Board of Railroad Commissioners of the state of Kansas has ordered the Missouri Pacific to provide separate passenger service, of one train daily each way, between Topeka and Fort Scott, on the Kansas, Nebraska & Dakota Railroad. The matter was a complicated one. A separate passenger train did not pay the cost of running. On the other hand, the money spent for the construction of the road had been mostly raised by the aid of municipal subsidies; and the people who had furnished so much of the money thought that their convenience ought to be consulted quite as much as that of the operating company; especially since some of the promises of extension, made at the time when the money was raised, have never been fulfilled. To this fact of municipal subscription the Board gives great, and perhaps undue, weight. It virtually holds that such subscriptions entitled the localities to all the benefits which they expected from the construction of the road. The whole matter of municipal subscriptions to bonds has been so mismanaged that it is hard to say where the right lies. Railroad commissioners, representing local interests are almost certain to give the benefit of the doubt to the people of the state and against outside owners. But one thing is clear—the underlying principle of this decision conflicts practically with the attempt to control rates. The United States Supreme Court will not sustain them both. If a man is compelled to furnish service whether he will or no, he must be allowed to charge what he can get; if he is restricted by the legislature as to his charges, he cannot be deprived of the right of withdrawing service when it becomes unprofitable. Common carriers have been subjects of special regulation from time immemorial, and this was made the basis of the Granger decision thirteen years ago: but we know of no precedents which compelled a common carrier to stay in the business when it did not pay expenses.

WE have recently been told that the Rio Grande Western is removing driver brakes from all its ten-wheel passenger engines. On this road heavy passenger trains are run on grades of 211 ft. per mile. It was said also that the company was taking the driver brakes off from its freight engines. While we were aware that the "water brake" was used on the engines of this road, we did not believe that driver brakes would be done away with on a line where the most efficient and powerful brakes that can be had are required. In fact, we are told by the Master Mechanic, Mr. Smith, that the driver brakes were taken off only temporarily where they had been badly arranged originally, and that five new freight engines are equipped with the American driver brake, and that "it will only be a matter of time when all engines will be equipped with them." All the engines of the Rio Grande Western are equipped with the so-called "water brake" (Le Chatelier), which is used for regular running down heavy grades. The Master Mechanic of the road says that with this device "an engine will hold nearly as much as it will haul up the same grade, and it is much better on heavy grades than driver brakes." He has several times had tires loosened by the continuous application of the driver brakes on grades of 211 ft. per mile. There can be no question of the efficiency of the water brake for mountain roads, but it, as well as the driver brake proper, must be used with skill and discretion. An engine runner who would loosen his tires with the driver brake would be likely to knock out cylinder heads with the water brake, and if one were compelled to choose between the two evils he would be puzzled which to take first. That wheels are slipped or tires loosened with driver brakes is a very inadequate reason for doing without them when these accidents are most likely to happen and when they are most needed. In fact, on the Northern Pacific, where the water brake has been used for six or eight years on mountain engines, and where it is considered to be of great value, it is *not* used without driver brakes. That is, it is considered essential to use driver brakes, water brakes and train brakes, and none of these appliances would be dispensed with. On the other hand, the Denver & Rio Grande discarded brake shoes on drivers in 1888, and so far as we know still relies upon the water brake exclusively for engine braking; but the Superintendent of Motive Power states that "we never pretended to use it for retarding trains, as we have had all our cars and engine tenders equipped with air brakes since 1877." That is, the water brake is relied upon simply to hold the engine on grades where the tender brake is not sufficient.

### Position of Steam-Heating Couplers.

The results of the past winter's experience in heating passenger cars by steam is in the main satisfactory. Those railroads which have used steam heat during the winter will generally continue and extend its use. Some will go faster than others with the equipment of their cars, owing to different opinions as to its necessity, or as to the perfection of the systems now in use. Of course, the money available is also a consideration. The Union Pacific has lately given a large order for a mail train equipment, and the Pennsylvania Railroad has decided to increase its equipment by 100 cars, using substantially the system which was described in the *Railroad Gazette* March 15 and March 22, 1889. This system has met all the demands yet made upon it, and on suburban trains running out of Pittsburgh the heating system combined with the ventilating apparatus has met with the enthusiastic approval of suburban passengers. Like reports are made from other points on the line, and equally good results from steam heating are reported on numbers of other lines using different systems. In most cases lack of ventilating apparatus is still a serious defect, and it is a defect which is increased rather than decreased by the substitution of steam for the coal or wood stove.

The claims of the steam-heating companies, put forth in enthusiastic circulars during the early days of steam heating, together with what they deemed to be the necessary requirements of a practicable steam-heating system, have resulted in a demand from railroad men for a perfect system. At present the requirements which have to be met by steam-heating companies are in various particulars greater than need be. In the early stages each company claimed perfection in some particular feature and pressed it upon the attention of the public as a necessity; the combined effect of many such claims being to set up a standard, which no one system could entirely meet.

Probably no other detail is so difficult to bring up to this high standard as the coupling. A full list of the requirements for a satisfactory coupler and of the claims made for all the various designs would be amusing reading, in the light of experience, and would appal the most enthusiastic inventor who set out to combine them all. Some of them are:

Automatic uncoupling when the train parts; entirely metallic connection; perfect freedom of motion; no sag between cars; a coupling that will not be liable to be injured when hit by chunks of coal lying on the track or by any implement used by the trainmen; no leak after continued use; such simplicity that inexperienced trainmen can use them; a coupling in which water will not collect so as to freeze or to offer resistance to the passage of steam; a joint that is not affected by heat, cold or moisture, which is little injured by contact with foreign substances, and which is so located that it is not liable to injury by coming in contact with its coupling mate or other bodies; a connection which will not be opened by a sudden increase of steam pressure above the maximum pressure used for steam heating; an automatic drain for each coupling which permits the water of condensation to escape; a coupling which as it couples does not cause the surfaces of the joint to grind together; a coupling which can be uncoupled with one hand; a connection which is not in any way injured if accidentally frozen up when full of condensed water; protection from condensation in the connections; a cheap coupling made of materials which do not offer inducements to thieves.

These are a few of the requirements which have been given as necessary to be met. Nearly all of them have appeared at some time or other in circulars of steam-heating companies as essential requirements of a practicable coupling. While all of these requirements are desirable, many of them are not essential to a practicable coupling. Half of them could be dispensed with without impairing the service efficiency of a steam-heating coupling, and there are now on the market a number of couplings, any one of which will do satisfactory work.

On the other hand, there is one requirement which is

absolutely essential, but which has had far less consideration than many of the non-essentials; that is, the location of the steam connection between cars. Whatever be the design, construction, method of operation or location of the connection or piping underneath or between cars, it should in no way interfere with any appliance upon which the safety of the train depends. The truth of this general statement must be admitted by any one, and it has lately had a terrible illustration. There is but one way in which the steam-heating connections can seriously interfere with the safety of the train, so far as experience has shown; that is, by covering the air-brake connection with ice so that the brake hose is pulled off when the cars part. Even this ought not to endanger the train, and would not, except under exceptional conditions. It is, however, a source of delay, inconvenience and expense.

The freezing of air-brake couplings from the drip from the stream-heating couplings is a question of position rather than of construction, because it is not to be hoped for or expected that we shall ever get a steam coupling that will be perfect after it has seen considerable service, and leakage must be expected and cared for in all systems of steam heating yet proposed. This is true even for the vacuum and return systems whenever the pressure in the pipes is greater than in the atmosphere, which is almost always the case in the outgoing pipe, excepting in very mild weather.

Condensation and leakage being, therefore, practically unavoidable, it follows that the relative location of the hose must be such as to prevent any probability of water reaching the air-brake connections. As bearing out this opinion, and in further development of the subject, we give on another page extracts from letters received from railroad officers and officers of companies making steam-heating apparatus.

There is little call for comment on the opinions there given, which are practically all one way. Actual instances of air-brake couplings frozen up by the drip from the steam couplings above them might be given in sufficient numbers to do away with any suspicion that the opinions quoted are merely theoretical.

There is one objection which has been raised to dropping the steam-hose coupling below the air-brake hose that ought to be considered; that is, the increased sag. With reference to this, it is best not to express a decided opinion until more facts are at hand. We do know, however, that the experiments of the Standard Car Heating and Ventilating Co. at Pittsburgh showed that when there were sags in the couplings and those sags were filled with water, the pressure required to lift the water was equal to the total height of all the sags in the train. Also we know that the limited train on the Pennsylvania has been running successfully with the greatest possible amount of sag in the connections. The coupling just clears the planking between the tracks at a station, and that is all. No more sag could be put in if one tried to do so, yet there seems to be no difficulty on that train. There are two sides to this sag problem, and the exact practical effect of a drop coupling can only be learned by actual experience. The theory is that the total pressure required to lift the water from the sag is equal to the weight of water on one arm of the sag, and this is true if the sag be full of water. But there is a strong probability that there is but little water in the sag when the heating system is operating, because the passage of steam carries the condensed water with it, and we have seen cases where the couplings have been parted after a long run and no water was present. Again, whatever be the location of a single coupling, more or less sag will exist and the small increase caused by dropping the steam hose below the air may not be of any great importance; at least so the actual comparisons of two systems that have couplings above and below the air would indicate.

## Train Signals and Conductor's Valves.

A correspondent asks if the Bay View disaster would have been averted had the train been equipped with an electric train signal. When we say that it probably would not, we do not mean to say a word in favor of the ordinary bell rope, the defects of which we have often pointed out. That our criticisms have been well founded, and that they have borne some fruit is made quite evident by the increasing use of the pneumatic train signal, which is now universal on many thousands of miles, and is becoming common on still other thousands.

A bell rope must be fastened at the rear of the train sufficiently taut to keep it from dangling on the heads of passengers, while, at the same time, it must be so loose as not to ring the gong when the train turns a sharp curve. The brakeman sometimes fails to get the exact adjustment on a long train, and the gong is rung when there is nothing wrong with the train. Again, the spring on the gong may not be strong enough to pull back the bell rope, and the conductor may give a less number of strokes than he intends to or supposes he gives. In consequence of this false ringing some engineers get in the habit of paying little heed to gong signals of one stroke each, and this habit, which grows on them, has been referred to as one of the contributing causes of the Bay View collision, though we do not learn that the collision occurred on a curve, and it seems probable that the engineer could not have averted the collision in any event. If the gong rang when the cars first separated, he would, if he had looked back, have seen the tail lights, and would hardly have felt called upon to use additional steam. If the gong did not ring until just before the collision, it would have been futile for him to apply more steam, because the brake was very soon applied in spite of him. We cannot see that an electric or a pneumatic signal would have averted the consequences of such reckless and ignorant behavior as caused this collision.

A device which is made fast at each end of the car, and which thus has a limited and definite amount of slack, would of course obviate the objections to the bell rope arising from unusual length of train. Whether there are two cars or 20, the action of the slack with a pneumatic or an electric signal will be the same, and as a wire or an air hose can be applied so as to have very little slack, a break-in-two would manifest itself with more certainty, and probably much earlier, than with the old-fashioned rope. A device of this kind if properly maintained may be depended upon to give few, if any, false indications, and is therefore a great improvement on any appliance which often misleads by crying "wolf" when no wolf is near. If, therefore, a signal free from the objectionable features of the bell rope had been in use for some time on the Lake Shore, and had thereby made the runners more sensitive to indications of possible danger, it may be that Mr. Mooney would have taken some action to mitigate the disaster. As the precise circumstances are not all known to us, this is mere speculation. The importance of replacing the bell rope by something better is, however, so great that we would gladly give space to any amount of speculation (in the absence of facts), if this instance were needed as an argument. But as electrical and other means of practically instantaneous communication between distant points are now as familiar as household words everywhere, the desirability of applying modern invention to passenger trains needs no argument. Nothing but extreme poverty can warrant a superintendent in ignoring this fact. And a road too poor to provide the best possible means of communication between the different parts of a long train should confine itself to running short ones.

The Bay View collision has also started considerable discussion concerning the conductor's valve. The Westinghouse Brake Co. furnishes two kinds of valves—one which is seated by the pressure of a spring and closes automatically when not held open for the purpose of applying the brakes, and the other a common plug valve, which, when opened, remains in the open position unless it is closed by hand. It is a matter of opinion which pattern should be used, and the brake company gives railroads their choice. With the spring valve it is possible, after a train has been stopped, for the engineer to recharge the pipes and start again promptly, but an excited passenger may pull on the cord momentarily, and release it too soon to make an effective stop. An objection to the spring valve that has been offered is its location in the closet, where ignorant or mischievous persons will cause annoyance or delay by tampering with it. This, however, would seem to be an objection that could easily be obviated and should not be given great weight. The plug cock is so arranged that it can be opened only on the outside of the closet, the handle extending through the partition and the pull being in plain view of all the passengers in the car. With this a passenger not well acquainted with the device would be more likely to leave it open and thus make a prompt and sure stop. The objection here is that a prompt and sure stop is often found to have been ill advised. If the conductor decides that safety requires him to immediately move on, the great desideratum is to let off the brakes, not to put them on. Rear collisions resulting from negligence of flagmen in going back or from a following train running too close to a passenger train, are rationally chargeable to the vicious system in use for keeping trains apart. Whenever American roads adopt an effective block system these "accidents" will be reduced in number immeasurably, and people will not spend so much time and ink and paper in finding fault with a brake because it fulfils its purposes to perfection.

## State and Private Freight Tariffs.

Ever since its appearance in 1886, Ulrich's work on Railroad Tariffs has been the standard authority on European practice. A French translation which has just been published will make the work accessible to a much larger number of readers on this side of the Atlantic. It contains full details both of the legislative and of the actual rate sheets which have been in force in Germany at successive periods. For other European countries its information is less detailed, but it gives in extremely good shape all that any man is likely to want. The whole of this practical part occupies some 400 octavo pages.

While this is the most useful portion of the work, it is not the one which offers the largest field for editorial comment. What we now have to say is suggested by the theoretical considerations with which the book opens. The author states the general principles, as he understands them, which will guide private and state railroads, respectively, in the arrangement of their rate sheets; and on these grounds he proceeds to argue the superiority of state management. His influential position in the Prussian railroad service lends a semi-official character to his views, and enables us to have a side light on the theories of railroad management which prevail in that administration.

A private railroad is of course desirous to obtain as much money as possible; it reduces rates so far, and only so far, as increased volume of traffic will produce a gain in net earnings. Experiments of this kind are constantly going on in almost indefinite numbers, "giving inevitably," as the author says, "an *individual* shape to the tariffs; not large and uniform sections, with comparatively few classes, but an enormously large number of separate classes, of commodity rates and of special rates, in some cases going so far as to fix a special price for every piece of business with any special importance of its own."

Few railroad men will deny the justice of these strictures. The only question is whether they may not be applicable to state railroads also. But there is another set of criticisms directed against private railroad management which are wholly unjust. The author holds that private roads cannot make as low rates as state railroads. He seems to hold that they must make business pay directly, while state roads need not unless they want to. He goes so far as to combat the position that private roads can afford to develop new business at the bare cost of handling; saying that they cannot do it unless existing traffic is large enough to pay interest and maintenance (p. 39, Note 1, last two lines). This is probably a piece of inadvertence on the author's part; but it is significant of the kind of ideas prevailing in German railroad administration that such a thing should be said even through inadvertence.

The fact is that this part of the author's reasoning is weak at both ends. Private railroads can disregard fixed charges in making rates, whenever the condition of the traffic warrants it; state roads can not disregard fixed charges on any other ground than this, without arbitrary exercise of favoritism. If business is not destroyed by a high rate and not increased by a reduction, this fact in itself shows that it can be classed high without loss to the public. If it develops in large masses at a rate barely above the direct expenses of handling, it is an advantage alike to the railroads and the public to have it classed low. To insist on an arbitrary disregard of these facts as the advocates of state management so often do, is to substitute an arbitrary theory of rates for a natural one. "Reduce rates wherever it will increase net earnings" is the system which, if judiciously applied, best serves the public as well as the railroads. We admit that there are great dangers in its application; but there are equal dangers in any arbitrary enforcement of so-called "natural" systems, without by an means equal possibilities of good.

A few advocates of state railroad management recognize the existence of this state of things. Such is the position of Gustav Cohn, who holds that classification should be based on development of traffic, and that government authorities alone can be trusted to apply this principle. But Ulrich does not take this view. He holds that a government schedule should have comparatively little classification, except as between parcels and car-loads, and that rates should be arranged pretty nearly on an equal mileage basis; but exceptional rates, for particular commodities and routes, he thinks should be allowed. Why? Because, as he justly observes, you cannot make the system work without them. This does more credit to his practical sense than to his logic. On what ground are the exceptions to be made, except the one on which rates are arranged under private management? If this ground is openly disavowed, what becomes of the

justification for special rates in any event? If this ground is taken in some cases and disavowed in others, does it not become a matter of pure favoritism who shall have the benefit of the more liberal treatment?

After all, the difference between the principles which actuate state and private management are much slighter than Ulrich would have us believe. If a government road is well managed, it will not lose money for the sake of a theory. It will try to charge what the traffic will bear. Whether it does this more wisely and efficiently than a private road, or less so, will depend upon other conditions than the mere presence or absence of state ownership. If it is subject to competition, it will be more efficient in some respects, and less wise in others; and state railroads, being as a rule less subject to competition, are free both from its advantages and its evils. But this is due to the monopoly, and not to the ownership. If a road is not well managed its tariffs will be influenced by outside considerations; commercial corruption in a private road, political corruption in a state road. Each of these affects adversely the interests of the public which the road serves. The ultimate question is, which system will secure the best men. Prussia has good state railroads, because she has a good civil service, and not because there is any necessary virtue in the underlying principle.

## Inspectors.

Inspect [*in*, into, and *specio*, to view]. (1) To view in order to correct the errors or to learn the quality of. (2) To oversee, to survey.—*Worcester.*

The word so defined is not much used by American railroad men, except in relation to material bought and to describe the work done by the men who examine the running gear of passenger and freight cars. Military men know that organized and thorough inspection is vital to the sustained efficiency of an army. The Inspector-General's department in our service and the corresponding bodies in the best foreign armies have become *élite* corps, to which the most intelligent and ambitious officers often aspire. Officers of the highest character and professional attainments are thought none too good for a branch of the service which keeps all other branches in working order. The lack of the Inspector-General's department is, to the trained soldier, one of the most serious defects in semi-barbaric armies.

In our railroad service Pullman Palace Car Co. has inspectors to examine very closely into the conduct of its train employés; the Manhattan Elevated road has inspectors of stations, and the Savannah, Florida & Western has inspectors of train service who look into the behavior of conductors and brakemen. A few other roads have taken similar action, but in general this work is made a part of the duties of some other officer or officers. We do not say that inspection is not done, but it is not made a distinctive occupation. Every one admits that all grades of employés need to be looked after, but a careful study of the methods and results where inspection is made a matter of importance would afford convincing evidence that a mere general sentiment that supervision is important does not cover the case; but that a systematic embodiment of such theories in practice is necessary.

The necessity of inspection implies imperfection in the service. One could imagine a service wherein every agent, operator, conductor, engineer, brakeman, fireman and section master was perfectly qualified for his place, never needing the slightest reprimand or criticism; but even here there would be no way of securing uniformity of practice except by constant supervision, so that so long as men are differently constituted, the work of any large number in a given field must pass under the eye of a single head or leader. As the supervisor who is constantly visiting his subordinates performs his duties, as related to them, much more efficiently than if he remained at headquarters, no argument is needed to show that inspection at short range is incomparably better than standing off 100 miles and endeavoring to judge of men's work by whatever evidence the men themselves see fit to send in.

No body of men has a perfect *esprit de corps*. New men are constantly being added. Temporary absences of a part of the men give opportunity for others, if they are so disposed, to relax their observance of strict regulations, while technically not violating instructions. Reductions of force by reason of lack of appropriations tempt superiors to placate the men by modifying the strict conditions under which work should be done. These and other considerations make the need of inspection constant. Irregular or occasional examinations never give satisfactory results. It is not necessary to assume that employés are dishonest, or that they intentionally disregard regulations. Fidelity is a comparative term. We are all more or less faithless at times. An old railroad officer, experienced in dealing with somewhat "scaly" employés, said that he had no confidence in any one—not even himself. The rule in religion, equally good for a bank president or a railroad superintendent, is, never think any sin too great for you, yourself, to commit. The inspector should train himself to never apply to an employé any process to which he himself would refuse submission.

On one of the best managed roads, one where the men are much more closely looked after than is generally the case, and where trains are kept a station apart in bad weather, a dispatcher on a recent occasion became so anxious to get the trains through that he allowed two freights, a heavy passenger train and three other freights to be in the same block section at the same time on a very foggy morning. Part of the trainmen were depending for safety upon the block signals, and it was only by good fortune that a collision did not occur. The superintendent of this road, as we said, means to keep close watch of his men, but what was needed was a regular system of inspection. A man skilled in detecting the tricks by which time is saved at the expense of safety, and constantly engaged in such inspection, would doubtless have known this dispatcher's habits and would have cured them or discharged him. A proper system would also in all probability have educated these train men to refuse to run in the manner they did, or at least to promptly report the circumstances to headquarters.

By a proper system, we mean one having a sufficient number of inspectors to cover the field. This and numerous other branches of railroad work suffer, even when properly planned, by the appointment of men to cover 200 or 300 miles each when 100 or less is all that they can fairly attend to. The traveling engineer, who is always a profitable officer if he knows his business, generally has to neglect some of the points in which he might enhance the engineer's efficiency because he has too large a field. And he has not only to look after twice as many men as he can properly attend to, but on many roads must expect to find his position abolished whenever the directors deem it necessary to apply the pruning knife to the pay roll. He finds himself unable to scrutinize the engineers' habits in watching signals, in economizing time at meeting points, in reading telegraphic train orders, and such duties, not because he does not see some of their work in these particulars, but because he is compelled to make these subjects secondary to coal economy and mechanical questions.

Nearly every officer, high or low, has, practically, one or two lines of work to which he gives his best thoughts; his other duties, if he has a variety, being made of secondary importance. It is not in the nature of things that all the figures in a picture can be in the foreground. The weakness of much of the inspection now done lies in the fact that no one makes it his first business. Engineers and firemen, conductors and brakemen, station agents, operators, signalmen and section masters all can be made more efficient by more constant inspection. To employ inspectors intermittently disturbs the men unnecessarily, and is false economy for the company. To confine them to the mechanical department when some of the worst losses from inefficiency of men are caused by employés in other departments is a one-sided policy at best. As long as human life is of more consequence than dollars and cents, it will look illogical to carefully inspect a station man's cash account while not inspecting his handling of signals and train-order telegrams. We do not wait until he steals before investigating his financial methods; why wait until he kills some one before looking into his skill in train work? In armies, whence we drew our first comparison, the principle of eradicating inefficiency before, instead of after, it has resulted in loss or injury is fundamental. In railroad service the demands have so often kept ahead of the means of supplying them that officers are in danger of forgetting this principle, because they are overworked in correcting actual past or present wrongs or deficiencies; but it nevertheless is becoming more and more pressing year by year. Many of the early traditions and habits of the railroad service came from military life; perhaps we had better turn again to the same source now. Railroad officers who demur at measures calculated only to add a "superfine" touch to service which is already performed with a fair degree of excellence would do well to consider the fact that officers who have expended time, thought and money on the elevation of their men to a "gilt-edge" standard are practically unanimous in their satisfaction with the results and in their determination to take no backward step.

The statistics published last week, page 260, concerning car service associations were incomplete in some features. The Colorado Association is distinct from the Denver Demurrage Bureau, although the same manager, Mr. E. E. Hill, has charge of both. Mr. Hill, it will be remembered, is the pioneer demurrage manager, having been the organizer of the Omaha Bureau, established in October, 1887. It would seem from the report of the committee presented at the Time Convention that the Omaha Bureau, which had such astonishing success in the beginning, and which was really the experiment that incited all the successful work done since, has been allowed to lapse, as the date of organization of the present association there is given as Nov. 1 last. It will be remembered that hints of inharmonious management at Omaha were published some months ago. The following additional information is given in the report of the Time Convention Committee: The New York, Pennsylvania & Ohio, Pennsylvania Co., Valley, and Cleveland, Akron & Columbus have put car service rules into operation at all stations on their lines, except the Cleveland, Akron & Columbus at Canton. It is expected that the Chicago Association will extend its territorial jurisdiction as early as practicable to cover all that portion of Illinois west of the Lake and the line of the Chicago, Burlington & Quincy to Burlington. That the Illinois Car Service Association, headquarters at Peoria, will extend, as fast as practicable, to cover all the balance of the state of Illinois. That the Omaha Car Service Association will be extended eastward to embrace all that portion of Iowa west of the Des Moines River, and westward indefinitely. It is expected that another organization will be made soon to include the east half of Iowa, and another one with headquarters at Kansas City, including western Missouri and eastern Kansas, extending from the Missouri line southward to the south line of Indian Territory. There are Car Service Associations in force at Columbus, O., J. D. Berry, Manager; South Carolina, J. R. New, Manager. A movement is on foot for the establishment of an association at New Orleans, which will be in operation about May 1.

The *Equipment Guide* prints a list of associations, among which is the "Wisconsin and Michigan," with headquarters at Milwaukee and embracing the whole of Wisconsin and the upper peninsula of Michigan. This has just been organized.

It often happens that the assets of a business concern are worth much more than its liabilities, while at the same time the attempt to convert those assets into cash would not leave money enough to satisfy the claims of creditors. In such a case, instead of foreclosing, the sensible thing to do is to let the concern run on with as little interference as possible, accepting security for future payment in lieu of spot cash. Such, according to Mr. Spalding, one of the Government Directors of the Union Pacific is the present situation of that company. He holds that the Puget Sound extensions are of the utmost value to the goverment as well as to the present management; that the system is wisely managed in the interest of creditors as well as others; that while it cannot pay $52,000,000 cash, it is able to offer $86,000,000 worth of securities, and he adds:

"The question resolves itself down to this: What is best, not so much for the Union Pacific Railway Co. as a corporation, but for the country at large? It seems to me that there can be but one answer to this—let Congress deal as fairly with the Union Pacific as a business man would with a creditor who was willing and able to pay his debts if he were only permitted to attend to his business without interference or embarrassment."

A statement recently made public by President Corbin with regard to his course of action contains three leading points:

1. That the Reading lost $6,000,000 by the Jersey Central lease during the years 1883-6, or nearly $1,700,000 annually during its continuance.

2. That receipts per ton-mile and per passenger mile have been higher on the Reading than on the Central.

3. That previous to the year 1886 the deficiencies of the coal company had been habitually met by inflating the capital account of the railroad company; and that, if allowance be made for this fact, the showing for the company under Mr. Corbin's management has been relatively good.

The second point does not amount to much. The first and third are important. The chief difficulty with Mr. Corbin's position lies in the fact that he was himself so slow in finding out the true position of affairs, and that he promised, or seemed to promise, more than he could honestly perform. The error was in the wrong expectation, rather than the failure to fulfill it.

The ticket brokers naturally dislike the proposed amendments to the Interstate Commerce Law. They say that it would work against the weaker lines of railroad. This is probably true, but irrelevant. They say that commissions, under the existing system, are not used as a means of discrimination. This is misleading. If it means that any man may get the benefit of their division, if he is only shrewd enough, it is true. But it produces a virtual reduction of figures below published rates, for a broker will prefer to divide commissions,

rather than let his rival take the whole business. It thus pretty directly involves violations of the Interstate Commerce Law. Finally the brokers say that such a law will be unpopular. In this they are probably right. The law would on the whole tend to raise railroad revenues, and this is always unpopular. But that does not prove it undesirable.

The topics discussed at the Western Railroad Club this week were counterbalancing the reciprocating parts of locomotives, the Master Car-builders' interchange rules, and journal boxes. The proposed Chicago joint defect guard was also discussed. The details of the discussion will appear in the Club Proceedings, which will be issued on Monday next, according to the new plan of publication adopted by the Western Railroad Club. In connection with the subject of counterbalancing locomotives, our readers will find in the files of the *Railroad Gazette* for 1889, and earlier, and in the current volume, a discussion of all phases of the subject with reference to both two-cylinder and three-cylinder locomotives.

The reports published several weeks ago to the effect that the Michigan Central would put on a new fast train between New York and Chicago is going the rounds of the papers for a second time, and, as before, the statement is made that the running time between the two cities will be 23 hours, which is not correct. The WagnerCompany is building three complete trains for this service, and the new trains will commence running on May 11, the date fixed for the spring change of time; but their time will be the same as that of the present fast trains by the Lake Shore, 25 hours each way.

## NEW PUBLICATIONS.

*The Railways of Scotland; Their Present Position, with a Glance at their Past and a Forecast of their Future.* By W. M. Acworth. London: John Murray, 1890.

The chief defect of this book, as of the same author's larger work, "The Railways of England," published last year, is the almost exasperating lack of precise information. His method of treatment is "popular" in the extreme. The book is not long, however, only 191 pages of text, and the type is large so that one can quickly get through it, and he will acquire some fairly clear notions of the geography, history, character of traffic and method of working of the railroads of Scotland. There are, moreover, an index and a good map, showing the various systems in different colors. Naturally Mr. Acworth has much to say of the effect of the Forth Bridge on the competing lines. He places the cost of "the complete scheme of which Forth Bridge is the central point" at £4,500,000 and the savings in distance are tabulated as follows:

| *London to Perth.* | Now. | Will be. |
|---|---|---|
| By West Coast, miles | 450 | 450 |
| Midland Route, miles | 475½ | 455 |
| East Coast, miles | 462 | 441½ |
| *London to Aberdeen.* | | |
| By West Coast, miles | 540 | 540 |
| Midland Route, miles | 565½ | 536½ |
| East Coast, miles | 552 | 523 |

When one considers the heavy interest charges and the cost of maintenance of this vast structure it seems as if the distances saved could hardly compensate for the outlay. For short seasons, however, there is a very heavy passenger travel, which is growing yearly, and the shortening of time sure to follow the reduced distances and increased competition will doubtless stimulate this business to a still more rapid growth.

Incidentally, Mr. Acworth describes the system of electric lighting employed by the North British on its underground line in Glasgow. Certain trains run by this route from Edinburgh to Helensburgh and require light in the carriages for 10 minutes out of three hours. This is supplied automatically by incandescent lamps. A current is passed through a central insulated rail, up through the lamps, by means of contact rollers running on this rail, and back by the wheels to the track rails. There are two lamps in each compartment. In the first-class compartments both are lit; in the third-class, only one. But if that is broken or stolen (two or three are stolen every week) the other is automatically thrown into circuit. The cost is said to be about one penny per lamp per hour.

*Report on European Dock-Yards.* By Naval Constructor Philip Hichborh, U. S. Navy. Government Printing Office, Washington.

Naval Constructor Hichborn was sent to Europe by the United States Government in 1884 to make an examination of and report upon the dock-yards of England, France, Germany and Russia. In his report he gives a résumé of the principal characteristics of all of the Government and some of the private yards of these countries. He also gives the dimensions and most noteworthy features of the ships of war that were at the several yards at the time of his visit. The report embraces numerous plans of yards, with elevations of vessels and details of certain portions.

These last constitute a valuable portfolio for the naval architects. Mr. Hichborn attributes a portion of the completeness of the French yards to the extremely low wages that are paid, which renders cost insignificant. A laborer receives about 30 cents per day, a journeyman 45 cents, a very skilled workman 80 cents or $1, and a gang foreman of the first rank $1.60 per day. At the end of 25 years' service an employé is retired on a pension of two-thirds his highest pay.

An interesting feature of the book is the copy of the rules and regulations of a Scotch ship-building firm. These are so full, elaborate and exhaustive that one naturally thinks that a man capable of remembering them all and with character enough to abide by them ought to be worthy of better things than the pittance of a workman in a European dockyard.

*Journal of the Franklin Institute.*—The April issue of the *Journal* contains an article of 29 pages on Electric Railways, by Eugene Griffin. It is quite a comprehensive review of the topic and a fair account of methods of construction and operation. The same issue contains the report of the Committee on Science and Arts, on Mr. Hollerith's Electric Tabulating System, with illustrations and some description of the apparatus. The Committee say that they consider the system invaluable wherever large numbers of individual facts are to be summed and tabulated, and they consider that the inventor is deserving of the greatest commendation for this useful and novel application of electricity, and strongly recommend that he be granted for his invention the highest award in the gift of the Franklin Institute, namely, the Elliott Cresson medal.

*Proceedings of the Eighteenth Meeting of the American Society of Railroad Superintendents.* C. A. Hammond, Secretary, No. 350 Atlantic avenue, Boston, Mass.

This pamphlet contains not only a full report of the eighteenth meeting of the society, but the complete text of the three essays on Track Work which were received in competition for the prize offered by the society. These essays are by Andrew Morrison, Lehigh Valley Railroad; H. W. Reed, Master of Roadway, Savannah, Florida & Western, and E. H. Hill, Real Estate Agent, C., C., C. & St. L. We published extracts from these in our issue of Nov. 8, 1889, and those extracts gave a pretty fair idea of the scope of the papers. They are three very excellent essays, and will be found useful to the younger members of the railroad profession, and not without valuable suggestions to the older ones.

*Traité Générale des Tarifs de Chemin de Fer, contenant une Etude Spéciale des Tarifs Appliqués en Allemagne, Autriche-Hongrie, Suisse, Italie, France, Belgique, Hollande, Angleterre et Russie.* Par F. Ulrich, &c., &c. Paris: Libraire Polytechnique, Baudry et Cie, Editeurs, 1890.

This work appeared originally in 1886. The Erench edition now published has been thoroughly revised and a chapter on Russian tariffs has been added, making the work not merely a translation but really a second edition. We have treated the subject matter of this work in our editorial columns, and therefore make no further review of it here.

## TRADE CATALOGUES.

*The London & Northwestern Railway* does a good deal of intelligent advertising for American patronage, and, like other intelligent advertising, it doubtless pays. One of its latest advertisements is a little circular issued by Mr. C. A. Barattoni, General Passenger and Freight Agent for North America, which gives a good deal of information useful to those about to cross the Atlantic. Among other conveniences mentioned, the company will check baggage from residences, hotels or stations in New York and neighboring cities direct to London, Edinburgh and other stations on its lines. The company will get baggage through the custom house, provide omnibuses or coaches on receipt of a telegram from Queenstown, and do other things to make matters easy for the traveler. Private parlor or family cars are supplied from Liverpool to London at a moderate charge. Vestibule drawing-room cars, with all sorts of luxuries, are also advertised, although the American accustomed to travel *en prince* will miss the barber, the bath-room, the stenographer, the ladies' maid, the surgeon and the dispensary, which he has learned to think are indispensable to a really comfortable railroad journey. We insist that the most progressive of English roads has still a good deal to learn from us.

*Noiseless Motors and Steam Street Cars for City and Suburban Railways.* Third edition. Baldwin Locomotive Works, Philadelphia, Pa.

This is a handsome catalogue of 24 pages, illustrating and describing various motors built by the Baldwin Works. The motors shown vary in size and weight from 8 in. × 12 in. cylinders, 13,000 lbs., to 15 in. × 24 in., 60,000 lbs. They are made with four and six drivers, coupled, and with or without pony trucks. In tractive power they range from 250 tons up to 1,150. The most powerful are designed for switching and freight service in city streets. The steam street car shown has 8 × 10 cylinders, weighs about 21,000 lbs., and seats 20 passengers. This is sometimes built with a pony truck, and a seating capacity for 30 or more persons. All of these motors are provided with exhaust chambers to prevent the noise or sight of escaping steam. A brief general discussion is given of the relative economy of horses, cables, electricity and steam motors for city lines, and a partial list of such roads using steam motors. There is an interesting table of the service results obtained on 31 different roads, giving grades, curvature, loads, miles run and cost per mile of operating.

## TECHNICAL.

### European Engineering Contracts to be Let.

The Hungarian Government wishes American contractors to know of certain work which is to be done to improve the Danube River, and we give here a synopsis of the same, furnished by Mr. Palitschek, the Austro-Hungarian Consul at New York City. The work is the improvement of the so-called "Eisernes Thor" and the cataracts on the lower Danube. The work will comprise in the first series, the blowing up of rocks at the rapids near Sztenka, Kozla-Dojke, Izlas Taihtalia, Greben, Incz, etc., amounting in all to 162,000 cubic metres. The second series will comprise breakwaters near Greben and Incz, amounting in all to 612,000 cubic metres of stonework and 104,800 of pavements. The third series will comprise the building of a shipping canal at the "Eisernes Thor," and the erection of a bridge with a span of 10 metres. The contracts will be let by His Excellency, the Royal Hungarian Minister of Commerce in Budapest. All offers must be accompanied by guarantees for the work, in the first series, of 100,000 florins, for those of the second series, of 90,000 florins, and for those of the third series, of 160,000 florins. Twenty per cent. of the work is to be accomplished in each year, and the entire work must be finished in 1895. The plans, contract blanks, stipulations and profiles are open for inspection of those interested at the Consul's office, 33 Broadway.

### Machine Shops Destroyed.

The United States Rolling Stock Co.'s shops at Decatur, Ala., accidentally caught fire April 9, and much of the plant was destroyed. The fire was discovered in the forging department of the car works. The machine shop, blacksmith shop, bolting room and engine room, with their contents, including a 300 H. P. engine, were destroyed. The loss is about $200,000, probably fully covered by insurance. The main building, the wood working shop, was uninjured.

The boiler rooms and machine shops of the Lewis & Fowler Mfg. Co., in Brooklyn, N. Y., were destroyed by fire April 10. The works employed over 400 men. The loss is about $100,000. Large orders for street cars had been received, and an extra force was to have begun working the next day.

### The Tampico Jetties.

In a recent interview, Mr. E. L. Corthell said that the lines for the Tampico jetties have been verified and finally determined upon, and that the construction of the work had actively begun. The railroad between Tampico and the jetty works, about six miles, was under construction and would be completed inside of two months; that there would be rail communication with the material yards and the shops and the jetty trestle, from which trestle it was intended to build the work, and over which a railroad track, connected with the railroad on shore, the materials, piles, timber, rock and brush would be carried on cars by locomotives to any desired point, even to the sea ends of the jetties. Mr. Corthell said comfortable houses would be built for the workmen and adequate preparations of every kind made as soon aspossible for the rapid progress of the works with a large force.

## RAILROAD LAW—NOTES OF DECISIONS.

### Powers, Liabilities and Regulation of Railroads.

In New York the Supreme Court decides that a grant of the right to use a strip of land for the purposes of "ingress, egress and regress," and on which the grantee, an ice company, could pass and repass railroad cars containing ice and materials, the only limitation in the grant being that it was not exclusive, and that the right could not be assigned except to the successors of the grantee in the ice business, is not a mere license, but an irrevocable grant. The grantee is not restricted to the track as at first constructed, but may change its location to any part of the strip specified in the grant.[1]

In Louisiana the Supreme Court holds that the city of New Orleans has full control and regulation of the streets of the city, and can grant the use of a street railroad already constructed to another, which she has authorized to be operated. And the method of making compensation for such use, indicated by ordinance, must be followed.[2]

In New York the Supreme Court holds that where a proposed joint lease between four railroads is executed by three and the fourth company refuses to execute it, whereupon two of the others retract, equity will not compel the fourth company, at the suit of its stockholders, to execute the lease.[3]

In Minnesota the Supreme Court rules that a hotel owned by a railroad corporation, and kept by its lessee as a hotel and place of summer resort, is not included within the exemption from ordinary taxation enjoyed by the corporation in respect to such of its property as is held and used for railroad purposes.[4]

The Federal Court rules that a guaranty by the lessee of a railroad to "pay the interest upon the within bond as specified in the interest coupons thereto attached," is not a separate promise to pay each coupon, but is a guaranty of the whole interest to become due on the bonds, and, though each coupon is for less than $100, the guaranty is not prohibited by the Vermont statute, requiring the obligations of a railroad company to be for not less than $100 each.[5]

### Carriage of Goods and Injuries to Property.

A North Carolina statute provides that agents of railroads and other transportation companies "shall receive all articles of the nature and kind received by such company for transportation, whenever tendered at a regular depot, . . . and shall forward the same by the route selected by the person tendering the freight under existing laws." The Supreme Court holds that the words "whenever tendered," could not be limited further than to require the tender to be made during reasonable business hours, and were not qualified by the words "under existing laws," which could be construed as qualifying the word "forward;" and that a rule of an express company forbidding its agents to receive money for shipment except on and before the day when trains went to the point of destination was invalid.[6]

In Indiana the Supreme Court rules that an illustrated catalogue, the individual property of a traveling salesman, prepared by himself, at his own expense, necessary for his convenience and use in his business, and carried with him on his trips, is personal baggage, for the loss of which, by his valise being lost, the carrier is liable.[7]

In Wisconsin, in an action against a railroad for delay

in transporting hogs, it appeared that through defendant's negligence the hogs were put on the Chicago market Saturday, instead of Thursday; that there was no market for them till Monday, when they could all have been sold; but that plaintiff only sold part of them on Monday, keeping the balance till Tuesday and Wednesday, when he sold for less than on Monday. The Supreme Court decides that he could recover for expense of keeping, shrinkage in weight and depreciation in value only from Thursday till Monday.[8]

**Injuries to Passengers, Employes and Strangers.**

The Supreme Court of the United States rules that where a ticket expressly provided that no employé is authorized to waive any conditions of the contract, the action of a baggageman in punching a passenger's ticket and checking his baggage, and of the gateman in admitting him to the train, does not estop the railroad to deny his right to be carried on his return trip without compliance with an express provision of the ticket that it shall be stamped and signed by the agent at the place of destination, before it will be received for return passage."[9]

In Indiana the Supreme Court holds that a passenger who remains on the platform of a car at the rear end of a long train of freight cars, after warning to leave it, assumes the risk of injury caused by the jerk with which the train starts.[10]

In Connecticut a passenger alighted from a train at the station in the evening. There were four flights of stairs leading from the platform, and three of these were sufficiently lighted, while the other was in the dark. He knew the premises, and passengers were accustomed to use any of the stairways indiscriminately. He passed the three which were lighted, and, missing his calculation in approaching the other, fell and was injured. The Supreme Court of Errors rules that the passenger was negligent, and that the railroad is not liable.[11]

In Alabama the Supreme Court holds that a passenger going upon the platform of a moving train, for the purpose of getting off after the train is stopped, and remaining there only long enough to ascertain that the train would not stop longer, is not riding on the platform, within the meaning of the regulation which prohibits his riding there.[12]

In a case in the Federal Court, a trackman was running a hand-car, under direction of a section boss, toward an approaching train, to which the boss had sent a signal-flag by one of the trackmen to warn those in charge of the train of the approach of the hand-car. The persons in charge of the train failed to keep a lookout, and ran into the hand-car before those in charge could get out of the way, and he was killed. The Federal Court holds the railroad liable.[13]

In Georgia the Supreme Court holds that where the injury to an employé is the result of the negligent moving of a train while he is engaged, in the line of his duty, in lifting or adjusting a bumper, the fact that the bumper was defective will not bar recovery.[14]

In Texas the Supreme Court decides that more than ordinary care is not required of a railroad in regard to appliances for the use of the employés.[15]

In New York a car had been left in such a way that it projected over the crossing of this road by a road on which plaintiff was employed as engineer. Plaintiff, on approaching the crossing, saw the car and jumped from his engine, receiving the injuries sued for. The Supreme Court of Appeals decides that the railroad was liable, and that the plaintiff was not guilty of contributory negligence in violating the rules regulating the speed of trains, where there was evidence that his train was restricted to 18 miles an hour, and he was only running at 15; or in not approaching the crossing with caution, where there was evidence that he slackened speed and kept a good lookout, and that the car on the crossing was a flat one, and not so easily seen as a box car; or in not heeding the signal to stop as soon as it was given, where there was evidence that he attempted to stop as soon as he saw the signal.[16]

In Kentucky the deceased, who was driving four unhitched horses, riding one of them, approached a railroad crossing along a road where the view of the railroad was at different points more or less obstructed, and about 115 ft. from the crossing stopped to talk to some men, when a passing train frightened the horses, and caused them to run away, whereby deceased was killed. The men with whom he was talking testified that they heard no whistle. Other witnesses within hearing distance heard no whistle, or were not positive that it was at the crossing. The Court of Appeals holds the railroad liable.[17]

[1] G. L. & P. J. R. Co. v. N. Y. & G. L. Co., 8 N. Y. Supp., 26.
[2] C. & C. R. Co. v. C. C. R. Co., 6 South. Rep., 849.
[3] Ives v. Smith, 8 N. Y. Supp., 46.
[4] State v. St. P., M. & M. R. Co. 44 N. W. Rep., 63.
[5] E. T. Bk. v. St. J. & L. C. R. Co., 40 Fed. Rep. 423.
[6] Alsop v. South. Ex. Co., 10 S. E. Rep., 297.
[7] Staut v. Kendrick, 23 N. E. Rep., 79.
[8] Ayres v. C. & N. W. R. Co., 43 N. W. Rep., 1123.
[9] Boylan v. Hot Springs R. Co., 10 S. C. Rep., 50.
[10] L. & N. R. Co. v. Bisch. 22 N. E. Rep., 662.
[11] Bennett v. N. Y., N. H. & H. R. Co., 18 Atl Rep., 668.
[12] Cent. R. & B. Co. v. Miles, 6 South. Rep., 696.
[13] Howard v. D. & H. Canal Co., 40 Fed. Rep., 195.
[14] Central R. Co. v. Lavier, 10 S. E. Rep., 279.
[15] Tut. & S. N. R. Co. v. Bell, 12 S. W. Rep., 321.
[16] Albert v. Sweet, 22 N. E. Rep., 762.
[17] Estercose v. C., N. O. & T. P. R. Co., 12 S. W. Rep., 580.

## LOCOMOTIVE BUILDING.

The Wheeling & Lake Erie has placed an order for 17 new locomotives with the Pittsburgh Locomotive Works.

The New York, Pennsylvania & Ohio has received the first two of the order for 10 locomotives recently placed with the Baldwin Locomotive Works.

The Birmingham, Sheffield & Tennessee River has four locomotives under contract.

The Denver & Rio Grande has let an order for 48 locomotives to the Baldwin Locomotive Works.

The Baltimore & Ohio has just received six consolidation locomotives from the Baldwin Locomotive Works, and six more are to be delivered in a few days.

## CAR BUILDING.

The Duluth & Iron Range, Duluth & Winnipeg, Great Northern and Cheshire roads are in the market for new equipment.

The Wisconsin Central has let a contract for building 100 box cars to the Indianapolis Car & Mfg. Co.

The Birmingham, Sheffield & Tennessee River road has recently placed an order for 100 drop bottom gondola cars.

The International & Great Northern has received 250 of the 800 box cars ordered last February. The six passenger cars ordered at the same time will be delivered by May 1.

The Texas & Pacific has completed several passenger cars and a postal car at its shops at Marshall, Tex.

The Sioux City & Northern has let 400 cars to the St. Charles Car Co.

The Burlington, Cedar Rapids & Northern has placed an order with the Michigan Car Co., of Detroit, for 25 refrigerator cars, of the Standard Tiffany Refrigerator Car Co.'s patent, with Bosmann tanks. These cars are to be 34 ft. long, and of 50,000 lbs. capacity. They will be placed in the general service of this line.

The Erie Car Works have received an order from the Columbus, Shawnee & Hocking Valley road for 500 coal cars.

The Philadelphia & Reading, Central of New Jersey and Baltimore & Ohio have recently placed orders with the Pullman Car Co., for cars for 12 passenger trains to run between New York and Washington.

The Wason Mfg. Co., of Brightwood, Mass., is building a number of passenger cars for the Chilian government roads, to be equipped with seats made by the Scarritt Car Chair Co., of St. Louis.

The Roanoke Machine Works, of Roanoke, Va., has received an order from the Norfolk & Western for 500 box cars.

The Southern Iron Car Line, of Atlanta, Ga., has leased ed during the past 30 days the following equipment to roads in the southeast: East Tennessee, Virginia & Georgia, 500 gondolas and 500 box cars; Coal Creek Mining & Manufacturing Co., for service on the East Tennessee, Virginia & Georgia, 1,000 gondola cars; Savannah, Americus & Montgomery, 200 platform cars, and South Carolina road, 300 box cars.

Mr. T. C. Salveter, lately connected with the St. Charles Car Works, proposes to build a large manufacturing plant at Venice, Ill. Land has been secured near the eastern approach of the St. Louis Merchants' bridge, and shops will at once be erected having capacity of 20 freight cars per day.

## BRIDGE BUILDING.

**Astor, Fla.**—The Jacksonville, Tampa & Key West is to erect a bridge at Astor, and the surveys are now being made.

**Bellevue, Pa.**—The plan to build the Allegheny & Bellevue electric road bridge across Jack's Run at California avenue has been abandoned.

**Brantford, Can.**—The County Council has been asked to build a bridge across Grand River, costing $10,000.

**Cincinnati, O.**—The King Iron Bridge & Mfg. Co., of Cleveland, has been awarded the contract for a bridge to be built across the Ohio River between Newport, Ky., and Cincinnati, by the Central Railway & Bridge Co. The structure will be completed in two years, and will be 3,000 ft. long, with a cantilever span. The channel span will be 520 ft. long. The bridge will extend from near the point of Licking, in Newport, to Broadway street in Cincinnati. Capt. John A. Williamson and Col. R. W. Wilson, of Newport, are interested in the project.

**Columbus, O.**—A bill is before the Legislature authorizing the City Council to issue $100,000 of bonds to build a viaduct at High street.

The City Council of Columbus, O., has not yet adopted the report of the sub-commiteee to award the contract for building the Buckeye Street bridge to the Smith Bridge Co., of Toledo, at its bid of $58,000. After the bids had been advertised for it was found that it might be necessary to lengthen a span from 50 ft. to 115 ft., and this point has not yet been decided.

**Del Norte, Colo.**—The county commissioners have contracted for the completion of the South Fork bridge, over the Denver & Rio Grande, on the Wagon Wheel Gap road.

**Jackson, Ky.**—The Jackson Bridge Co. has been charted by the Legislature.

**Kansas City, Mo.**—The following bids for constructing iron bridges were received by the County Surveyor: Wrought Iron Bridge Co., Lowell, one bridge, $750; Kansas City Bridge & Iron Company, Kansas City, one bridge, $280 and $235.

**Lafayette, Ind.**—The Lake Erie & Western will build a new bridge across the Wabash River at Lafayette.

**Macon, Ga.**—The County commissioners have decided to rebuild the Hartley bridge.

**Minneapolis, Minn.**—A bridge is to be built at Thirty-sixth street, near Lakewood Cemetery, at a cost of $6,000, of which two-thirds is to be paid by the Minneapolis street railroad, and one-third by the city.

The Chicago, Milwaukee & St. Paul is to erect an overhead bridge at Thirtieth avenue, south.

**New Roads.**—T. H. Ball, of Huntsville, Tex., is Chairman of a Committee of Survey appointed by citizens of Huntsville and Navasota, for a proposed road between those points through Anderson.

A survey has been made for a road from Bowie, Tex., on the Fort Worth & Denver City, to coal mines about six miles distant. The line will be built by W. Capps and others of Fort Worth.

**Norfolk, Va.**—The American Bridge & Iron Co., of Roanoke, Va., has been awarded the contract for three draw briages on this road.

**Philadelphia.**—Petitions have been signed for a public bridge over the Wissahickon Creek, in the neighborhood of Allen's lane and East Leverington avenue.

**Pittsburgh, Pa.**—Work on the Ohio connecting bridge is progressing. One span has already been completed on the Allegheny side at Woods Run, and the trestle across McClure avenue at that point will be finished this week.

**Pontiac, Ont.**—The bill empowering the Pontiac Pacific Junction road to build a bridge over the Ottawa River.

**Pottsville, Pa.**—The Pottsville Iron & Steel Co. has put in operation its new bridge plant recently erected.

**Quanah, Tex.**—The contract for erecting a bridge across Pease River has been awarded to the Milwaukee Bridge & Iron Co., Milwaukee, Wis.

**Roanoke, Va.**—A company with a capital stock of $200,000 is to be incorporated to conduct the business of the American Bridge & Iron Co. Walton, Wentworth & Huntley, proprietors.

**St. Paul, Minn.**—The contract for constructing an iron span at the centre of the roadway of the Washington avenue bridge has been awarded to the Canton Company, Canton, O., for $30,000.

**Salem, Ore.**—At a special city election it was voted to rebuild the bridge across the Willamette River. A steel bridge will probably be decided on.

**Sioux City, Ia.**—The Pacific Short Line will build a temporary pile bridge with a pontoon draw across the Missouri River.

**South Casselman, Ont.**—Proposals will be received until May 20, by O. Quenneville, County Commissioner, for building an iron bridge 32 ft. long, across the Nation River.

**Ste. Etienne.**—Two new Howe truss bridges over the River Beaurivage, at Ste. Etienne, county of Levis, P. Que., were opened last week. Each bridge has a span of 113 ft., of composite wood and iron, supported on two crib-work piers filled with stone, and having trestle approaches. The contract was executed by Louis Leclerc from plans by Mr. Vallee, Government engineer.

**Sykesville, Md.**—The County Commissioners of Howard and Carroll counties may build a bridge over the Patapsco River near Sykesville.

**Toronto, Ont.**—A bill has been submitted to the Board of Works for the construction of the Dundas street bridge. The structure is to be maintained by the city, and the Grand Trunk road is to pay $11,000 and the Canadian Pacific $9,000 towards the cost of erection.

**Various Projects.**—The Governor of Maryland has signed bills to authorize a bridge over the Nanticoke River and to incorporate the Berlin & Lovettsville Bridge Co.

The Commissioners of Somerset County, Md., have awarded the contract to build a bridge across Big Monie Creek, in St. Peters district, for $935.

## MEETINGS AND ANNOUNCEMENTS.

**Dividends.**

Dividends on the capital stocks of railroad companies have been declared as follows:

*Chicago & Western Indiana*, 1½ per cent., payable in April.

*Cincinnati, Hamilton & Dayton*, 1¼ per cent., payable April 30.

*Concord & Montreal*, 3 per cent. on the preferred stock of the Boston, Concord & Montreal, payable May 1, and 3 per cent. on the Concord stock, payable May 1.

*Lake Erie & Western*, quarterly, 1 per cent. on the preferred stock, payable May 15.

*Wheeling & Lake Erie*, quarterly, 1 per cent. on the preferred stock, payable May 15.

**Meetings.**

Meetings of the stockholders of railroad companies will be held as follows:

*Anniston & Atlantic*, annual, Anniston, Ala., April 30.

*Atchison, Topeka & Santa Fe*, annual, Boston, Mass., May 8.

*Bessemer & Birmingham*, special, Birmingham, Ala., May 5, to act upon a proposed consolidation with the Birmingham Union.

*Birmingham Union*, special, Birmingham, Ala., May 5, to act upon a proposed consolidation with the Bessemer & Birmingham.

*Canadian Pacific*, annual, Montreal, P. Que., May 14.

*Central of New Jersey*, annual, New York City, May 9.

*Chicago, Rock Island & Pacific*, annual, Chicago, Ill., June 4.

*Cincinnati & West Virginia*, special, United Bank Building, Cincinnati, Ohio, May 12, to vote upon a proposed increase of the capital stock.

*Delaware & Hudson Canal*, annual, New York City, May 13.

*Elmira & Lake Ontario*, annual, New York City, May 1.

*Lake Shore & Michigan Southern*, annual, New York City, May 7.

*Little Rock Junction*, annual, Little Rock, Ark., April 24.

*Louisiana & Missouri River*, annual, St. Louis, Mo., May 7.

*Louisville, New Orleans & Texas*, special, Memphis, Tenn., June 5.

*Memphis Arkansas & Texas*, annual, Memphis, Tenn., April 24.

*Mexican Central*, annual, Boston, Mass., May 7.

*Michigan Central*, annual, New York City, May 7.

*New York, Chicago & St. Louis*, annual, New York City, May 7.

*Norfolk & Western*, annual, Roanoke, Va., May 7.

*Ohio Southern*, annual, Springfield, O., April 21.

*Omaha & St. Louis*, special, Stanberry, Mo., April 28.

*St. Lawrence & Adirondack*, annual, Valleyfield, P. Que., May 1.

*Union Pacific*, annual, Horticultural Hall, 101 Tremont street, Boston, Mass., April 30.

*Utica & Black River*, special, New York City, April 22.

**Railroad and Technical Meetings.**

Meetings and conventions of railroad associations and technical societies will be held as follows:

The *American Society of Mechanical Engineers* will hold its twenty-first annual convention at Cincinnati, O., May 13.

The *Association of American Railway Accounting Officers* will hold its next annual meeting at the Stockton Hotel, Cape May, N. J., July 9.

The *American Railway Master Mechanics' Association* will hold its next annual convention at Old Point Comfort, Va., in June.

The *Master Car Builders' Association* will hold its next annual convention at Old Point Comfort, Va., June 10. Rooms should be secured of Mr. F. N. Pike, manager, Hygeia Hotel, Fortress Monroe, Va.

The *National Association of General Baggage Agents* will hold its next annual convention at Chicago, Ill., July 16.

The *Traveling Passenger Agents' Association* will hold its next annual convention at Buffalo, N. Y., August 19.

The *New England Roadmasters' Association* will hold its eighth annual meeting at Boston, Mass., Aug. 20 and 21.

The *New England Railroad Club* meets at its rooms in the United States Hotel, Beach street, Boston, on the

second Wednesday of each month, except June, July and August.

The *Western Railway Club* holds regular meetings on the third Tuesday in each month, except June, July and August, at its rooms in the Phenix Building, Jackson street, Chicago, at 2 p. m.

The *New York Railroad Club* meets at its rooms, 113 Liberty street, New York City, at 7:30 p. m., on the third Thursday in each month.

The *Central Railway Club* meets at the Tift House, Buffalo, the fourth Wednesday of January, March, May, August and October.

The *Northwest Railroad Club* meets on the first Saturday of each month in the St. Paul Union Station at 7:30 p. m.

The *Northwestern Track and Bridge Association* meets on the Saturday following the second Wednesday of each month at 7:30 p. m. in the director's room of the St. Paul Union station, except in the months of July and August.

The *American Society of Civil Engineers* holds its regular meeting on the first and third Wednesday in each month, at the House of the Society, 127 East Twenty-third street, New York.

The *Boston Society of Civil Engineers* holds its regular meetings at Boston, at 7:30 p. m., on the third Wednesday in each month. The next meeting will be held at the American House.

The *Western Society of Engineers* holds its regular meetings at its hall, No. 67 Washington street, Chicago, at 7:30 p. m., on the first Tuesday in each month.

The *Engineers' Club of St. Louis* holds regular meetings in the club's room, Laclede Building, corner Fourth and Olive streets, St. Louis, on the first and third Wednesdays in each month.

The *Engineers' Club of Philadelphia* holds regular meetings at the house of the Club, 1,122 Girard street, Philadelphia.

The *Engineers' Society of Western Pennsylvania* holds regular meetings on the third Tuesday in each month, at 7:30 p. m., at its rooms in the Penn Building, Pittsburgh, Pa.

The *Engineers' Club of Cincinnati* holds its regular meetings at 8 p. m. on the third Thursday of each month at the Club rooms, No. 24 West Fourth street, Cincinnati.

The *Civil Engineers' Club of Cleveland* holds regular meetings on the second Tuesday of each month, at 8:00 p. m., in the Case Library Building, Cleveland. Semi-monthly meetings are held on the Fourth Tuesday of the month.

The *Engineers' Club of Kansas City* meets in Room 200, Baird Building, Kansas City, Mo., on the second Monday in each month.

The *Engineering Association of the Southwest* holds regular meetings on the second Thursday evening of each month at 8 o'clock, at the Association headquarters, Nos. 63 and 64 Baxter Court, Nashville, Tenn.

The *Civil Engineers' Society of St. Paul* meets at St. Paul, Minn., on the first Monday in each month.

The *Montana Society of Civil Engineers* meets at Helena, Mont., at 7:30 p. m., on the third Saturday in each month.

The *Civil Engineers' Club of Kansas* holds regular meetings on the first Wednesday in each month at Wichita, Kan.

### American Society of Civil Engineers—Annual Convention of 1890.

The annual convention will be held at Cresson, Pa., on the line of the Pennsylvania Railroad, on the western slope of the Alleghany mountains, between Altoona and Johnstown. There is a very large hotel managed under the direction of the Railroad Company. The date will be near the end of June; the exact day will be announced. Members are invited to contribute papers or discussions on papers already published. A concise abstract of any paper to be presented should be sent to the Secretary not later than May 31. This will make discussion more probable, as a copy of the abstract will be sent to members who may be expected to contribute discussion. JOHN BOGART, Secretary.

### Civil Engineers' Club of Cleveland.

A regular meeting was held in the club rooms April 8, President Searles in the chair. Harry Fitch Coleman was elected an active member. The president made some remarks relative to the present condition of the club, and suggested that steps be taken to secure more commodious quarters in the future. The president announced the receipt of communication from the committee of American Society of Civil Engineers, inviting a committee of conference on the question of affiliation between that society and the club. A motion was made to refer the matter to a committee, which after some discussion was passed. A committee was appointed as follows: Messrs. A. Mordecai, J. Whitelaw, Mr. Hollway, W. R. Warner, and H. C. Thompson. Mr. Eisemann stated that the Cleveland Architectural Club desired to form some affiliation with the Civil Engineers' Club, for the joint use of the rooms and other purposes. The matter was referred to the following committee. Messrs. Barber, Staley and Palmer. Mr. Hermann moved the appointment of a committee to carry out the suggestions made by the president on the question of increased facilities for the club. The motion was carried and the following committee was appointed: Messrs. W. R. Warner, S. T. Wellman, William Chisholm, H. M. Claflen and Gen. James Barnett.

A paper was read by Mr. Ambrose Swasey, on "The Eiffel Tower, from Foundation to Lantern," which was illustrated by a number of large diagrams and a large model of the tower, after which an interesting discussion was held. Mr. Whitney, of the Pratt & Whitney Co., of Hartford, Conn., was present and made a few remarks.

### Engineering Association of the Southwest.

A regular monthly meeting was held at the Galt House, in Louisville, April 10, at 7.30 P. M. Mr. Charles Hermany, Chief Engineer of the Louisville Water-works, read a paper on "Excavating in Pneumatic Caissons," and Mr. R. L. Engle, Chief Engineer of the Louisville & Jeffersonville Bridge, read a paper on "The Foundation Work of the Louisville & Jeffersonville Bridge." Other papers were also read and discussed. Before leaving the city the visiting members visited the Louisville, Kentucky & Indiana and Louisville & Jeffersonville bridges and other engineering works.

### Engineers' Club of Philadelphia.

A regular meeting was held April 5, President H. W. Spangler in the chair; 18 members and two visitors present.

The Secretary reported the special meetings of the Board of Directors and past officers to take action with regard to the death of Mr. Frederick Graff. It had been ordered that his portrait be appropriately set on an easel and draped in mourning for thirty days, and that flowers be added to the drapery on the meeting night. The following announcement had been prepared by the committee whose names are appended thereto:

*To the Engineers' Club of Philadelphia:*

With much sorrow we announce officially the decease of our late fellow-member, Frederic Graff. Mr. Graff was President of the Club during the third year of its existence, and has been active as a director of its business affairs, and, as a member, participated in the discussions and proceedings of its meetings, for which his extensive knowledge, not only of professional matters, but of those having general interest, eminently fitted him.

The most responsible office filled by him in his native city, that of Chief Engineer of the Water Department, to which he was elected upon the death of his father, was marked by honesty of purpose, executive ability and a thorough acquaintance with the requirements of the position; and the successful discharge of his onerous duties added to his renown as an engineer. As a man, his genial nature endeared him to his associates, and his loss to them will be a cause for deep regret.

Respectfully submitted,
WASHINGTON JONES, Chairman.
HENRY G. MORRIS,
THOS. M. CLEEMANN,
RUDOLPH HERING.

The foregoing report was adopted and ordered to be printed in the record of meeting and a copy thereof transmitted to the family of Mr. Graff.

The Secretary presented, for Mr. Frank Cooper, Notes on Railroad Engineering Drawing. The author treats of kinds of drawings required, paper, tracing cloth, inks, tinting, lettering, plotting topography, scales, railroad curve patterns and filing drawings. There was some discussion by Messrs. Edward Hurst Brown, Prof. L. F. Rondinella and Howard Murphy. Mr. Brown stated that it was the practice in his office, instead of making drawings on paper and then tracing them upon linen, to use smooth surface Crane's bond paper, which comes in sheets of various sizes. The drawings are made in pencil on this, and when correct are inked in at once, avoiding any chance of errors arising from the tracing linen slipping after a tracing has been begun. Blue prints are made directly from the finished drawings, requiring, with a moderately sensitive paper, from seven to eight minutes to make a print in bright sunlight. This method of making drawings not only saves the time usually required in making the tracing, but is a considerable saving of expense, as linen is by no means an inconsiderable item in office expenses.

Mr. Edwin S. Crawley described a new form of steam valve, in which packing is used instead of a ground seat. He exhibited a model and drawings. There was some discussion by Messrs. Henry G. Morris, Prof. H. W. Spangler and Howard Murphy.

### Railroad Surgeons.

The third annual meeting of the National Association of Railway Surgeons will be held in Kansas City, Mo., on May 1, 2 and 3, 1890. The officers of the Association are: President, J. B. Murdock (Pennsylvania), Pittsburg, Pa.; Vice-Presidents, W. B. Outten (Mo. Pacific), —. Elliott (Central of Georgia), W. B. Rogers (Illinois Central), J. F. Pritchard (Chicago & Northwestern), G. P. Conn (Concord & Montreal), T. P. Livingston (Union Pacific), J. F. Bancroft (Denver & Rio Grande); Corresponding Secretary, E. R. Lewis (Wabash), Kansas City, Mo.; Recording Secretary, C. B. Stemen, Fort Wayne, Ind.; Assistant Secretary, A. G. Gunmaer (New York, Chicago & St. Louis), Buffalo, N. Y.; Treasurer, R. Harvey Reed (Baltimore & Ohio), Mansfield, O.

### Technical Society of the Pacific Coast.

The Society held a monthly meeting at 408 California street, San Francisco, April 4. The society elected the following members: J. G. Pohle, Adam Edward Chadzko and P. M. Randall. A communication from the American Society of Civil Engineers was read, requesting the society to use its influence to test the Bear Valley arch dam on the construction of the newer and higher dam, observing any deflection, as such experiments may throw considerable light on the elasticity of masonry. It was decided to appoint a committee, consisting of E. J. Molera, R. E. Browsee, Prof. F. Soule, Luther Wagoner and L. M. Clement, to co-operate with A. Lietz and Joseph Sale, to consider ways and means for such experiments.

A paper on "Coffer-Dams," and treating of open caissons, was read by Randall Hunt, C. E. Mr. Hunt spoke of the difficulties attending the construction of coffer-dams in sandy soil, and how, in many instances, they could be supplanted advantageously by bottomless caissons. Mr. Wagner gave an account of his experiments in stretching steel bars beyond their elastic limit.

## PERSONAL.

—Mr. J. A. Stewart, Superintendent of the Kentucky Midland, has resigned to accept the office of City Engineer of Cincinnati.

—Mr. J. S. Cark, who, for the past four years, has held the position of General Passenger Agent of the Gulf, Colorado & Santa Fe, has tendered his resignation, to take effect April 25.

—Mr. Phillip A. Warrack, Assistant General Freight Agent of the Missouri River division of the Union Pacific, died in Omaha, April 11, of typhoid fever, after an illness of three weeks.

—The title of Mr. J. M. Hannaford, Traffic Manager of the Northern Pacific, has been changed to General Traffic Manager. Mr. Hannaford has been Traffic Manager of the road for the last four years, and was previously General Freight Agent.

—Mr. H. B. Stone, Second Vice-President of the Chicago, Burlington & Quincy, has resigned, and it is reported that Mr. G. B. Harris, Vice-President and General Manager of the Chicago, Burlington & Northern, will succeed him.

—Mr. Samuel F. Pierson, President of the Pennsylvania, Lehigh & Eastern, and late Assistant Commissioner for the trunk lines at New York, is reported seriously ill at his residence in Holmesburg, Pa. His physicians have hopes of his recovery.

—Mr. Alton Angier, General Passenger and Ticket Agent of the Western & Atlantic has resigned his position to become a United States Consul to France. Mr. Angier has been connected with the road since 1884, first as Assistant General Passenger Agent.

—Mr. Robert M. Rogers, Jr., General Freight and Passenger Agent of the Indiana, Illinois & Iowa, has resigned, and will engage in mercantile business. Mr Rogers was previously General Agent of the freight department of the Chicago, Burlington & Quincy, at Kansas City.

Among the directors chosen at Chicago for the proposed World's Fair are Stuyvesant Fish, President of the Illinois Central; J. C. Peasley, Vice-President of the Chicago, Burlington & Quincy; Charles C. Wheeler, formerly General Superintendent of the Chicago & Northwestern: E. T. Jeffery, formerly General Manager of the Illinois Central, and M. M. Kirkman, Second Vice-President of the Chicago & Northwestern.

—Col. Winslow Judson, President of the St. Joseph, St. Louis & Santa Fe, died in St. Joseph, Mo., April 7, after an illness of six weeks, of paralysis of the lungs, developing into paralysis of the brain. Col. Judson was one of the most prominent men in St. Joseph and was connected with many of its business enterprises. He was President of the Board of Trade for several years. He was one of the organizers of the St. Joseph Terminal Co. and a director of the St. Joseph Union Depot Co.

## ELECTIONS AND APPOINTMENTS.

*Allegheny Valley.*—The annual meeting of the stockholders was held in Pittsburgh last week, and the following Board of Managers was elected: Henry D. Welsh, George B. Roberts, Joseph N. Du Barry, John P. Green, A. J. Cassatt, N. P. Shortridge, William A. Patton, Charles E. Speer and B. H. Rubie.

*Atlanta & Florida.*—George P. Howard, General Agent, has been appointed General Freight and Passenger Agent of this road, with office in Atlanta, Ga.

*Atlantic Avenue Elevated (Brooklyn).*—The incorporators are: President, Austin Corbin; Vice-President, J. Roger Maxwell; Secretary, Frank McDonough; Treasurer, Henry Graves.

*Boston & Maine.*—J. T. Chamberlain has succeeded D. C. Richardson as Master Car Builder of the road, with office in Lawrence, Mass.

*Burlington & Missouri River.*—H. G. Adams has been appointed Chief Dispatcher and Operator of the line west of Ravenna, known as the Wyoming Division, with headquarters at Alliance, Neb.

*Central Pacific.*—The directors have elected the following officers: President, Leland Stanford; First Vice-President, C. P. Huntington; Second, C. F. Crocker; Third, A. N. Towne; Treasurer, Timothy Hopkins; Secretary and Comptroller, E. H. Miller, Jr.

*Chicago & Alton.*—The annual meeting was held in Chicago, April 8. There were 127,385 votes polled out of a possible vote of 175,945, resulting in the election of James C. McMullin, John A. Stewart, and Albert A. Sprague to serve as Directors for three years, and A. C. Bartlett to serve one year, the unexpired term of John Crerar, deceased. The Directors elected officers as follows: T. B. Blackstone, President; J. C. McMullin, Vice-President; Charles H. Foster, Secretary and Treasurer; Charles H. Chappel, General Manager; Corydon Beckwith, General Solicitor; Chauncy Kelsey, Auditor. The annual meetings of the Joliet & Chicago, St. Louis, Jacksonville & Chicago, and Alton & St. Louis were also held the same day.

*Chicago & Eastern.*—The incorporators and first board of directors of this Illinois road are: George C. Hadley, John E. Martin, and George H. Ketchen, of Toledo, O.; Thomas C. Loucks, Elgin, Ill.; and L. E. Overman, Nelson C. Jennings, and Christopher Whalen, Chicago.

*Colorado Midland.*—At the annual meeting of the stockholders of the road, held in Colorado Springs, Col., last week, the following board of directors was elected: C. W. Benson, J. R. Busk, Thomas C. Jerome, S. S. Sands, W. B. Sloan, F. F. Thompson, of New York; Thomas F. Davis, of Newport; R. J. Daniel, B. Eeles, of Cleveland; J. J. Hagerman, of Colorado Springs, and Henry T. Rogers, of Denver.

*Corsicana & Southeastern.*—The incorporators are: James Garritty, Charles H. Allyn, H. G. Damon, J. T. Sullivan, A. Fox, S. S. Freedman, C. W. Jester, R. M. Collins, S. W. Johnson and J. E. Whiteselle, of Corsicana, Tex.

The Directors have elected the following officers: Charles H. Allyn, President and General Manager; James Garitty, Vice-President; C. W. Jester, Treasurer; H. G. Damon, Secretary pro tem.

*Davenport, Iowa & Dakota.*—The annual meeting of the stockholders of the company was held in Davenport, Ia., lately and the following were elected directors: W. C. Wadsworth, M. L. Marks, Joe R. Lane, H. C. Fulton, J. E. Lindsay, A. C. Fulton, Robert Krause, James Thompson, S. F. Smith. The directors elected the following officers: President, W. C. Wadsworth; Vice-President, M. L. Marks; Treasurer, J. R. Lane, and Secretary, H. C. Fulton.

*Eufaula Terminal.*—The following directors have been elected: Lewis McLean, Capt. S. H. Dent, E. B. Young, W. N. Reeves, A. H. Merrill, J. W. Tullis and J. G. Guice.

*Fairhaven & Southern.*—The officers of this company are now as follows: Nelson Bennett, President, and C X. Larrabee, Vice-President, of Tacoma, Wash.; E. M Wilson, General Manager and Treasurer; E. L. Cowgill Secretary; J. J. Donovan, Chief Engineer, and A. J Borie, Assistant Superintendent; all at Fairhaven, Wash

*Fort Wayne, Cincinnati & Louisville.*—John P. Ramsey is now Roadmaster of this line, vice J. C. Wagner, resigned. He has charge of the maintenance of roadway, bridges and buildings.

*Fort Worth & Denver City.*—W. F. Henderson has been appointed Master Mechanic, with headquarters at Fort Worth, Tex., to succeed John F. White, resigned.

*Fort Worth & Denver Terminal.*—G. M. Dodge and J. L. Granger, of New York, and E. W. Taylor, Morgan Jones, Peter Smith, W. F. Sommerville, A. B. Adams, W. A. Adams and J. F. Swayne, of Fort Worth, are the incorporators.

*Gulf, West Texas & Pacific.*—The annual meeting of the directors and stockholders was held in Victoria, Tex., April 9. The Directors elected are: C. P. Huntington, J. Kruttschnitt, C. C. Gibbs, W. G. Van Vleck, D. C. Proctor, A. Dacosta, W. M. Monserratte. Officers: J. Kruttschnitt, President; M. D. Monserratte, Vice-President; W. J. Craig, Treasurer; C. S. Wells, Secretary.

*Hannibal & St. Joseph.*—P. H. Houlahan, Trainmaster of the road, has been promoted to the position of Assistant Superintendent, with head-quarters at Brookfield, Mo.

*Illinois Central.*—G. W. Hatter, Trainmaster at Cairo, Ill., has been appointed to succeed William Wilkinson as Superintendent of the Springfield division of this road.

*Iowa Central.*—John L. Gath, Trainmaster of the Iron St. Louis, Mountain & Southern, has been appointed Superintendent of this road, with headquarters at Keithsburg, Ill.

*Jeffersonville, Madison & Indianapolis.*—J. M. Lindley, Louisville, Station Master at the Fourteenth street station, has been appointed Trainmaster, to succeed J. B. Safford, recently appointed Superintendent of the Louisville, New Albany & Chicago.

*Jersey City & Bergen.*—The company has re-elected Charles B. Thurston, A. L. Dennis, T. W. Jackson, H. D. Welsh, N. P. Shortridge, J. N. Du Barry, L. Zabriskie, J. B. Vredenbergh, H. H. Houston, William Brinkerhoff, and Edward F. C. Young, Directors.

*Kansas City Connecting.*—The company has been chartered in Missouri and Kansas by Heman Clarke, A. B. Paine, D. R. Offerly and D. M. McNeice, of New York City, and J. Seymour Scott, of Kansas City. J. Campbell Scott is President and W. B. Knight is General Manager and Chief Engineer.

*Kansas City, Fort Smith & Southern.*—The annual meeting of the stockholders was held at Neosho, Mo., April 12. The following directors were elected: L. L. Bush, H. M. Fickinger, H. W. Bush, J. C. Cravens and John W. Bush. The officers elected were: L. L. Bush, President and General Manager; C. A. Fouder Smith, Vice-President; H. W. Bush, Secretary and Assistant Treasurer; H. M. Fickinger, Superintendent and General Freight and Passenger Agent; A. M. Nelson, Chief Engineer, and John H. North, Attorney.

*Kansas Railroad Commission.*—A. R. Greene has been re-elected State Railroad Commissioner.

*Kentucky Central.*—Lewis Hood has been appointed Superintendent, with headquarters at Cincinnati.

*Little Miami.*—C. E. Lindsay has been appointed Engineer of Maintenance of Way, to succeed W. B. Leeds, promoted. Mr. Lindsay was formerly Assistant Engineer on the Western division of the Pittsburgh, Ft. Wayne & Chicago road.

*Lockport & Northern.*—The directors have elected the following officers: President, William Spalding; Vice-President, W. T. Ransom; Treasurer, John Hodge; and Secretary, Charles Hoag.

*Louisville & Nashville.*—E. E. Snyder has been appointed Roadmaster of the second division, and J. T. Craik, formerly Roadmaster of the Second and Nashville & Decatur divisions, is now Roadmaster of the Nashville & Decatur and Nashville, Florence & Sheffield divisions. Mr. Snyder was formerly Roadmaster of the Pensacola & Atlantic division.

K. S. Stoner has been appointed Assistant Engineer of the Henderson division, with headquarters at Evansville, Ind.

*Louisville, New Albany & Chicago.*—H. H. Kendrick, Auditor of the Pittsburgh & Lake Erie has been appointed to a similar position on this line with office at Chicago.

The office of Division Freight Agent at Louisville has been abolished. W. H. Newman has been appointed General Agent of the Freight Department, vice A. V. LaFayette, Division Freight Agent, resigned, with office at Fourth and Market street, Louisville. H. H. Kendrick has been appointed Auditor in place of Joseph Craig, resigned.

*Louisville Southern.*—M. Turpin has been appointed General Agent of this Company, in charge of the freight and passenger business, with headquarters at Atlanta, Ga.

*Macon & Atlantic.*—W. B. Sparks, President; J. Lane, General Manager; G. W. Gustin, Attorney, all of the Macon Construction Co., are the incorporators of this company.

*Millen & Southern.*—This company has elected the following board of directors: L. R. Millen, of New York, L. Johnson, of Waycross, Ga., W. B. Stillwell, of Savannah and J. W. Preston, of Effingham county.

The directors have elected the following officers: President, L. R. Millen; Vice-President, W. B. Stillwell; General Manager and Treasurer, J. W. Preston, and Secretary, W. F. Baker.

*Morgan's Louisiana & Texas.*—The directors have re-elected the following officers: President, A. C. Hutchinson; Vice-President, J. G. Scriever; Secretary, J. B. Richardson.

*New York Central & Hudson River.*—At the annual meeting of the stockholders of the company in Albany, N. Y., April 15, the following were elected Directors: Cornelius Vanderbilt, Chauncey M. Depew, Horace J. Hayden, Charles C. Clarke, William K. Vanderbilt, Frederick W. Vanderbilt, Samuel F. Barger, J. Pierpont Morgan, and Cyrus W. Field, of New York; William Bliss of Boston; Sherman S. Jewett of Buffalo; Erastus Corning of Albany, and George C. Buell of Rochester.

*Northern Pacific.*—This company, under terms of lease dated April 1, has assumed control of the lines of railroad heretofore known as the Wisconsin Central system, and will operate the same under the title of Wisconsin Central lines, Northern Pacific Railroad Co., lessee. S. R. Ainslie will continue in charge of the property as General Manager, and Gavin Campbell as General Superintendent and Acting General Manager, with the same authority as heretofore. The authority of the following officers of the Northern Pacific has been extended to cover the lines of the Wisconsin Central system: J. A. Barker, General Auditor; George S. Baxter, Treasurer; J. M. Hannaford, General Traffic Manager; O. C. Greene, Superintendent of Telegraph. Agents of the Wisconsin Central system and officers of other lines will transact business incident to the leased property with the following local officers in charge: David S. Wegg, General Solicitor; T. J. Hyman, Auditor; Abbott Lawrence, Acting Comptroller; R. W. Maguire, Cashier and Paymaster; Henry C. Barlow, Traffic Manager.

*Oregon Railway & Navigation Co.*—L. A. Anderson, Assistant Treasurer of the Union Pacific, has been appointed Treasurer of this road, to succeed Prosper W. Smith, who still continues as Secretary for the present.

*Panama.*—The stockholders of the company at their recent annual meeting in New York re-elected the old Board of Directors as follows: John Newton, Charles Coudert, Julius W. Adams, L. De Bebian, Robert A. Chesebrough, E. A. Drake, D. A. De Lima, Ernest L. Oppenheim, Samuel R. Probasco, J. Edward Simmons, D. Lowber Smith, Samuel M. Felton and Xavier Boyard.

*Philadelphia & Reading.*—M. E. Blaine has been appointed Acting Assistant Superintendent of the main line south of West Manayunk, Pa., vice B. B. Newton, resigned.

*Phillips & Rangely.*—The road was organized at Phillips, Me., this week, with H. P. Clossen President and William A. Rich Manager. The officers will award the contract for building the road, next week.

*St. Louis, Central & Western.*—The directors are: George A. Baker, E. R. Fuerborn, G. W. Parker, W. J. Blakely, and H. L. Edwards, all of St. Louis; H. C. Buhoup, of Chicago; G. L. Peabody, of Salem, Mass.; H. E. Warner, of Cambridge, Mass.; J. C. George, of Newburyport, Mass.

*San de Fuca Ship Canal and Railroad.*—The incorporators are: H. C. Walters, John Marshall, Theodore Wygant, F. K. Arnold, Lee Hoffman and William A. Bantz.

*Savannah & Oconee.*—De Witt C. Bacon and Horace P. Smart, of Chatham County, with Martin F. Amorous, of Atlanta, have chartered this company in Georgia.

*Seattle, Lake Shore & Eastern.*—F. W. D. Holbrook having resigned as Manager of this company, to take effect May 1, the position on that date will be abolished, and the duties will thereafter be performed by A. S. Dunham, Managing Trustee.

Mr. F. W. Dunn has been appointed Acting Superintendent, with charge of transportation, roadway and machinery departments.

*Southern Arkansas.*—The incorporators and directors of this Arkansas road are: John Bagley, C. B. Field, of Chicago, Ill.; Ed Daniel and T. F. Doyle, of Dry Run, Ark., and Geo. W. Clark, of Little Rock.

*Staten Island Rapid Transit.*—At the annual election recently the following Board of Directors were chosen: Charles Watrous, Erastus Wiman, Charles H. Bass, J. H. F. Mayo, August Forrman, William King, L. Dejonge, E. P. Goodwin, J. W. Mersereau, N. Marsh, George B. Ripley and George F. Kreicher. Erastus Wiman was elected President and Charles Watrous Vice-President.

*Tavares & Gulf.*—The first board of directors of this Florida road are: James P. Taliaferro, Daniel G. Ambler, Henry H. Jackson, Charles Tremain.

*Toledo & Western.*—The incorporators are G. G. Hadley, J. L. Martin, Elmer White, George H. Ketcham and L. S. Baumgardner.

*Union Pacific.*—Circulars have been issued announcing several new appointments and the redistricting of the Pacific or northwest division. These new districts are the Oregon, Washington and Water divisions. The first covers all lines between Portland and Huntington from Umatella to Wallula and the Heppner branch. The Washington division includes lines from Pendleton to Riparia, from Wallula to Walla Walla and the Dayton and Pomeroy branches. The Water division includes all steamboat lines on the Snake, Willamette and Columbia Rivers, as well as Puget Sound and the Pacific Ocean. C. W. Johnson and D. W. C. Perry have been appointed Superintendent and Assistant Superintendent of the Oregon division, with Thomas H. Walsh as Supervisor of Bridges and Buildings. E. Lyons becomes Superintendent of the Washington division and H. Vanderberg Road Master. J. W. Troup, of Portland, has been appointed Superintendent of the Water Division.

*West Shore.*—The stockholders of the road this week re-elected the following directors: Cornelius Vanderbilt, William K. Vanderbilt, Frederick W. Vanderbilt, Chauncey M. Depew Ashbel Green, J. Pierpont Morgan, Charles C. Clarke, Edward D. Adams, Horace J. Hayden, Samuel F. Barger, J. Hood Wright, Charles Lanier, and Charles Edward Tracey.

Mr. W. G. Wattson, Car Accountant, has been placed in charge of the distribution of equipment. His position, although unchanged as regards its title, is the same as that recently established on a number of the larger roads under the name of Master of Transportation or Superintendent of Car Service.

*Wisconsin Central.*—Frederick Abbot, of Milwaukee, Assistant Treasurer, has been elected Vice-President, to fill the vacancy occasioned by the resignation of Edwin H. Abbot, elected President. David S. Wegg, for some years past Second Vice-President and General Solicitor, has resigned, and Howard Morris, Secretary, was elected General Solicitor in place of Mr. Wegg.

## RAILROAD CONSTRUCTION,

### Incorporations, Surveys, Etc.

**Aransas Pass & Suburban.**—This company has been organized to build the proposed road between Corpus Christi and Aransas Pass, Tex. The capital stock is $100,000.

**Baltimore & Ohio.**—Surveys have been in progress for some time for an extension of the Valley division from Lexington to Salem, Va., and last week engineers were surveying an entrance to the latter city. But as yet nothing definite has been done regarding the extension, except the surveys, and it is not likely that it will be put under contract this season.

**Baltimore, South Baltimore & Curtis Bay.**—The Governor of Maryland has signed the bill to incorporate this company.

**Bayard, Petersburg & Moorefield.**—This road was incorporated in West Virginia this week with a capital stock of $1,000,000. The incorporators are John W. Nihiser, of Bayard, W. Va.; James B. Rees, of Rees, W. Va.; John R. Kaufman, of Sunbury, Pa.; Robert F. Whittier and John Allery, of Philadelphia, and Dr. Robert Leatherman, of Burlington, W. Va.

**Birmingham Mineral.**—A large force is working on a six-mile section from Milldale, Ala, toward Tuscaloosa, which, when completed, will bring the road within 15 miles of the latter town.

**Boise Central.**—The incorporation of this company was recently noted. About six years ago the citizens of Boise, Idaho, raised $43,000 and purchased shop grounds, station grounds, etc., within the city, and a right of way through it and extending westward 27 miles. This was deeded to the Oregon Short Line Co., and that company commenced building a branch line from Caldwell to Boise. After expending about $30,000 the Oregon Short Line abandoned the project and deeded back the property to trustees representing the subscribers to the original purchase. This property is greatly increased in value, and is now owned by the Boise Central. The plans for building the road have not yet been decided. C. W. Moore is President and Charles G. Clark is Secretary, both of Boise City.

**Burlington & Missouri River.**—John Fitzgerald & Bro., of Lincoln, Neb., have been awarded the contract to build an extension of this line northeast from a point on the Newcastle line, near the Cheyenne River, south of Newcastle, Wyo., through Custer City and Hill City to Deadwood, S. D., in the Black Hills. The extension will be about 100 miles long. It is stated that the maximum grade will not exceed three per cent. and that but three small tunnels will be necessary.

A contract has been let to Kilpatrick Bros. & Collins, Beatrice, Neb., for an extension from Newcastle northwest for about 100 miles in the direction of Buffalo, to a point on Horse Creek, near the Powder River.

**Chicago & Gulf.**—Forty bids were received for building this road, and the contract was awarded to a construction company organized by Chicago parties. The contract includes grading, tracklaying, erecting shops and stations, equipment and completing the road ready for operation. The road is to extend from Mobile, Ala., north along the west side of the Tombigbee River to Coffeyville, crossing it at that point, thence through Clarke, Marengo, Hale, and Tuscaloosa counties to the Warror River, near Tuscaloosa, and through Walker, Winston, and Lawrence counties to the south bank of the Tennessee River, at South Florence. The entire distance is about 365 miles. C. C. Merrick, of Chicago, is President.

**Columbus, Shawnee & Hocking Valley.**—A short branch at Zanesville, O., to connect the tracks of this road with those of the Cleveland & Canton, has been placed under contract. It is about 3½ miles long.

**Corsicana & Southeastern.**—This company has filed articles of incorporation in Texas to build the proposed road from Corsicana through Fairfield to a connection with the International & Great Northern in Freestone County, a distance of about 45 miles. The road will pass through the counties of Navarro, Freestone, Leon, Madison, Houston and Trinity. The capital stock is $500,000, and of this amount $188,000 has been subscribed at Corsicana.

**Delaware, Susquehanna & Schuylkill.**—The charter of this company has been filed in Pennsylvania. The line will be about 30 miles long, extending from Drifton, Luzerne County, Pa., to Eckley, at the junction of Luzerne, Schuylkill and Columbia counties. Eckley B. Coxe, of Philadelphia, is President.

**East & West Alabama.**—The section between Rockmart and Dukes, Ga., 58 miles is now being changed to standard gauge, and the work will soon be completed. The section from Hebron, near Dukes, to Grady, 52 miles, has already been made standard gauge.

**Fairhaven & Southern.**—The road has been located to Hamilton, Wash., on the Skagit River and the right of way has been secured to that point. Bids have been asked for building about 26 miles of the line. E. M. Wilson, of Fairhaven, Wash., is General Manager.

**Fort Worth & Denver Terminal.**—This is the name of the company organized by officers and directors of the Fort Worth & Denver City, to build a belt road at Fort Worth, Tex. Daniel Carey and A. S. Hayne, of Fort Worth, have the contract for grading the line.

**Fort Worth & Rio Grande.**—The company has recently completed an extension of the road from Granbury to Dublin, Tex., making the present line in operation 91 miles. The line from Dublin to Comanche has been located and work is now being prosecuted in Comanche County, with the intention of completing it to Comanche by June or July. The work now in progress is under the direction of the International Equipment Co., for about 12 miles in Comanche County between Dublin and Comanche, that company employing about 250 men. On this section but one steel span bridge of about 125 ft., with masonry or cylinder iron piers, is needed. The work presents no obstacles, the character of the soil being sandy loam and post-oak, with the exception of about one mile through Hamilton Gap, where some rock excavation will be necessary; probably not five per cent. of the entire work will be solid or loose rock. The maximum grade is one per cent. compensated, and the curvature is four degrees. The contracts for the grading in Erath County, masonry and timber work, bridges, stations, etc., the entire distance from Dublin to Comanche, will be let within the next 30 days. Several preliminary surveys have been run between Comanche and Brownwood, and others are to be made from Brownwood to Brady, and from Comanche to San Saba before it is determined what route will be taken south of Comanche.

The rolling stock will be ordered within the next 60 days. The financial arrangements for constructing and equipping the road to Comanche have been arranged. The syndicate having this matter in charge is composed of New York and Philadelphia bankers, who are interested in pushing the work through to Kerrville, Kerr County, which is the terminus of the present charter, but it is proposed to build ultimately through to the Rio Grande River. The New York office is at 18 Wall street, C. M. Wicker, Vice-President.

**Georgia, Carolina & Northern.**—The location has been completed through Athens, Ga., and to a point about six miles beyond Jug Tavern. Several routes are being surveyed from the latter point to Atlanta, one to Duluth, on the Richmond & Danville, and parallel to that line into Atlanta, and another to Lawrenceville, and thence between the Richmond & Danville and Georgia roads, passing near Clarkesville and to Atlanta.

**Greenville, Nashville & Chattanooga.**—An election will be held in Corinth, Miss., April 28, to vote on a proposition to issue city bonds to the amount of $60,000, of which $30,000 is to be paid when the road is completed from Corinth to the Tennessee River, and $30,000 to be paid when the road is completed to the western bounds of Alcorn County. The Board of Supervisors of Alcorn County may also order an election for the county to vote on issuing $60,000 on similar conditions. The road was recently chartered to extend through the counties of Washington, Bolivar, Sunflower, Tallahatchie, Lafayette, Union, Tippah and Alcorn, in Mississippi, with a branch from a point in Lafayette through Pontotoc and the northern portions of Lee and Itawamba, and to Chattanooga. John H. Rice, of Fort Scott, Kan., is director.

**Interoceanic.**—The Morelos division has been opened for passenger and freight traffic as far as Jojutla. On the Perote and Jalapa section the track is completed as

far as the bridge of Tejocotal, three kilometres beyond Las Vigas. The contractors expect to have the line completed through to Jalapa in May; the tunnel between San Miguel del Soldado and Bandevilla is more than half finished. On the Vera Cruz and Jalapa section, 40 kilometers of embankment and 26 miles of grading have been finished. At the Vera Cruz end, the rails have been laid for a distance of 12 miles. Work on this section is being pushed energetically.

The contractors have obtained a new concession for a line to start from a point between the present stations of Compañía and Ayotla and to rejoin the old line at San Martin. This line will be 40 miles in length and will give a total length of line between the City of Mexico and Puebla, 84 miles. Two parties of engineers are surveying this line.

**Jacksonville Southeastern Line.**—The extension of the Chicago, Peoria & St. Louis, from Litchfield to East St Louis, is expected to be completed by July 1, and ready for operation on that date. The contracts have all been let, and the section from Litchfield to Edwardsville, Ill., is now under construction. The road will enter St. Louis over the Merchants' bridge. The financial arrangements, and everything for the building and equipment of the road have been arranged for. An extension of the Litchfield, Carrollton & Western, from Columbiana to Sny Levee, is projected, but little has been done toward its construction, and it will probably, not be built this year.

**Kansas City Connecting.**—This company has been chartered in Missouri and in Kansas, with a capital stock of $250,000. The route in Missouri begins at a point on the Missouri River opposite the old town of Quindaro, and extends easterly through Platt and Clay counties to Randolph, thence across the Missouri River and south along the Blue River to Brush Creek, and westerly to the state line between Kansas and Missouri. The route in Kansas from the state line is westerly and northerly to the Missouri River at Quindaro, thus completing the entire circle around Kansas City. The road will be about 34 miles long and will connect with all roads entering the city. The locating parties are already in the field, and arrangements have been made for beginning the work of construction at once and carrying it through to completion as rapidly as possible. J. Campbell Scott is President, and William B. Knight, both of Kansas City, is General Manager and Chief Engineer.

**Kansas City, Navada & Fort Smith.**—Scott & Hinckley, of Kansas City, Mo., have been awarded a contract for grading the section of this road through Bates County, Mo., and Smith & Bradbury, of Kansas City, have the contract for the line through Cass County. They will begin work immediately. The next section from the Bates County line to Nevada will probably also be let soon. It is expected to have the road in operation to the latter point by Aug. 1.

**Kentucky Roads.**—Bills have been passed in the State Legislature to incorporate the following roads: Louisville & Danville, Lancaster, McKee & Middleboro, Kentucky River & Virginia, Cynthiana Western, and also the Pikeville & Big Sandy Bridge Co., and the Prestonburg & Big Sandy River Bridge Co.

**Kinneconnick.**—This road is under construction in Lewis County, Ky., from a connection with the Chesapeake & Ohio, above Kinneconnick River, to the Ohio River, about 8 miles. The line passes through a timber region and reaches stone quarries. The Chesapeake & Ohio will lay the track and operate the road.

**Mexican Roads.**—The government has granted a concession to Joaquin D. Cassasus for the construction of a road of not more than 4 per cent. grade to join the peaks of Ixtaccihuatz and Popocatepetl with the Interoceanic road. The latter volcano is 17,800 ft. above the sea level. Work must be commenced one year from date. No cash subsidy is given.

**Middle Georgia & Atlantic.**—Work is now in progress on the section from Machen to Covington, Ga., 20 miles. Some surveys have been made from Eatonton through Sparta and Hancock County and easterly for a proposed line to Savannah.

**Millen & Southern.**—This company has been organized in Georgia to succeed the Rogers & Summit and to build an extension of that road from Stillmore south about 50 miles to a connection with the Central of Georgia at Stirling. The Rogers & Stillmore is owned by Stillwell, Millen & Co., of Savannah, and is being operated between Rogers and Stillmore, Ga., 30 miles. It is proposed to change the line from a point nine miles south of Rogers and build northeast to Millen, on the Central of Georgia, when the line to Rogers will be abandoned. The capital stock is $120,000.

**Milwaukee & Terminal.**—The route of this road, referred to last week, will begin at or near a point near the junction of the Milwaukee, Lake Shore & Western and Chicago & Northwestern, in Milwaukee, passing through Wauwatosa, North Greenfield, Bayview and St. Francis, and entering the city from the south, with short branches to warehouses, elevators, wharves, etc. Thomas S. King is Chief Engineer.

**Nashville, Chattanooga & St. Louis.**—The County Court, of Bledsoe county, Ky., has ratified the proposition of the company to extend the Jasper branch from Dunlap to Pikeville, Tenn., a distance of 20 miles, and exempted the road from taxation for 20 years. The cost of the right of way will be nominal. A corps of engineers will locate the road at once. The work will be in charge of Hunter McDonald, Assistant Engineer.

**National Tehuantepec.**—The following are the names of the principal officers engaged in the construction of this road: Concessionaire and Chief Contractor, Executors of the late Col. Mac Murdo, 28 Swithin's Lane, London; Sub Contractor and Builder of Road, Sr. Don Salvador Malo, Mexico; Chief Engineer Northern Division, Sir Thomas Tancred, Bart., Coatzacoalcos, Mexico; Chief Engineer Southern Division, Sr. Don Jose Velasquez, Tehuantepec, Mexico; Consulting Engineers, Hon. C. Stanhope and W. G. Ferrar, 37 Walbrook, E. C., London. This road when built becomes the property of the Government, and will probably be operated by them.

**New Jersey Belt.**—A survey is reported in progress between Cranford and Avondale, N. J., on the Central of New Jersey and the New York, Lake Erie & Western, respectively. The route is through Irvington, East Orange, Bloomfield and Belleville.

**New York City.**—Assemblyman Green's bill incorporating a company to build the proposed bridge across the Hudson River from New York City to the shore of New Jersey, was passed by the New York State Senate on Wednesday, without amendment, by a vote of 20 to 8.

**Northern Pacific.**—The branch from Durham north to the Raging River, near Snoqualmie, Wash., a distance of 18 miles, has been definitely located, and it is expected that construction will begin shortly.

Principal Assistant Engineer H. S. Huson states that the road will build an extension from Tacoma through Olympia, to Gray's Harbor, on the ocean, a distance of about 90 miles. Surveyors are now in the field, and the line will be in operation this summer. A line may also be built from the Portland division to Shoal Water Bay, south of Gray's Harbor.

**Omaha & South Dakota.**—The preliminary survey has been completed from Forest City to Mitchell, S. D., and as soon as the southern terminal point is determined the survey will be continued south of Mitchell. W. W. Olney, of Blunt, S. D., is Chief Engineer.

**Oregon Railway Extension Co.**—The company has filed supplementary articles of incorporation in Washington, to build 3,000 miles of railway in Oregon, Washington, Idaho and Montana. The road is controlled by the Oregon Railway & Navigation Co.

**Philadelphia & Reading.**—The company has declined to accept the ordinance passed by the City Council of Philadelphia recently, which authorized it to construct its proposed terminal elevated road from Ninth and Wallace streets to Twelfth and Arch streets, and to erect a station at the latter point. The company desires to extend the line one block beyond Arch street to Market street and to build its station there. It objected to the provisions in the ordinance which required it after the completion of the elevated line to use the surface tracks only during certain hours, and to the provision requiring it to discontinue the use of the passenger and freight station between Callowhill and Noble streets and Thirteenth and Broad streets. A new bill has been introduced in the Common Council authorizing the company to build elevated tracks at Ninth and Broad streets and from Broad and Noble streets to Twelfth and Market streets.

**Philadelphia & Sea Shore.**—The grading is practically completed on the entire division between Winslow and Sea Isle City, N. J., 35 miles, and the tracklaying has been completed for seven miles. The maximum grade is 26.4 ft. per mile and the maximum curve is three degrees. The road will probably be opened to Sea Isle City in June. The company proposes to cross the track of the West Jersey road at several places, but this has been opposed by the latter road.

**Providence & Norwich.**—A bill has passed the Rhode Island Legislature to incorporate this company. It is to build a road from Providence west through Johnson, Cranston, Scituate, Coventry and West Greenwich to Voluntown, Conn., also northerly from Providence through North Providence, Lincoln and Cumberland to Attleboro, Mass. This is to give a short connection between Boston and Providence. The capital stock is $4,000,000.

**Rockport, Langdon & Northern.**—The directors propose to issue $65,000 of first mortgage bonds on the road between Langdon and Rockport, Mo., six miles, which is now under construction.

**St. Louis, Centralia & Eastern.**—The charter of the company was filed in Illinois last week. The capital stock is $250,000. The company proposes to construct a double-track passenger line in St. Louis, commencing near the Mississippi River, west to the present terminus of the cable division of the St. Louis Cable & Western, near Vandeventer avenue and Morgan street; thence west and southwest to Forest Park, at some point between Union avenue and Skinker road.

**San Antonio & Aransas Pass.**—A reconnoisance has just been finished between Waco and Paris, Tex., and it is stated that a survey will soon be started between these points.

**San de Fuca Ship Canal & Railroad.**—Incorporated in Oregon to construct a ship canal between the straits of Juan de Fuca and from Puget Sound, Point Partridge, east to the harbor of San de Fuca, Wash. Also to construct a road from San de Fuca to the northern extremity of Whidby Island, crossing via Deception pass, or Big and Little Hope islands, to the mainland, near La Conner, Skagit County, Wash. A San Francisco paper states that another object—not stated in the articles of incorporation—is, in all probability, a scheme to work off town lots.

**San Francisco & North Pacific.**—The work of changing the Sonoma & Glen Ellen Branch between Ignacio to Glen Ellen, Cal., 26 miles, to standard gauge, was completed last week.

**Savannah & Oconee.**—This company has been chartered in Georgia to build a road extending from the Savannah River, in Chatham County, to the Oconee River, in Laurens County, passing through Chatham, Brian, Effingham, Bullock, Emanuel, Montgomery and Laurens counties. The distance is about 115 miles. The capital stock is placed at $250,000. The incorporators are De Witt C. Bacon and Horace Smart, of Savannah, and Martin F. Amorous, of Atlanta.

**Seattle, Lake Shore & Eastern.**—The tracklaying on the Northern extension is now completed to a point nineteen miles north of Snohomish, which is six miles south of the new town of Arlington. Arlington is halfway between Seattle and the international boundary line.

**Sioux Falls, Yankton & Denver.**—It is stated that funds have been secured in the East for building this extension of the Willmar & Sioux Falls division of the Great Northern from Sioux Falls to Yankton, S. D., 60 miles. E. G. Sherman, of Sioux Falls, is Vice-President.

**Southern Arkansas.**—The articles of incorporation of this company were filed in Arkansas last week. The company proposes to build a road to begin at Dry Run, Dallas Count, and extend to a point at or near section 3, township 14 south, range 13 west, in Calhoun Ccunty, a distance of 25 miles. The capital stock is $300,000. G. W. Clark, of Little Rock, is an incorporator.

**Springfield & Hillsboro.**—The company filed articles of incorporation in Illinois this week to construct a road from Springfield through the counties of Sangamon, Christian and Montgomery to a point on the Toledo, St. Louis & Kansas City in Montgomery County, south of Hillsboro. The principal office is to be at Springfield. The capital stock is $500,000.

**Tavares & Gulf.**—This company has been organized by H. H. Jackson, Charles Tremain and others, who purchased the Tavares, Gulf & Apopka at the recent foreclosure sale. The charter provides for a road from Tavares, Lake county, to Punta Gorda, in DeSoto county, 200 miles, a part of which is already constructed from Tavares to Clermont, 25 miles. The capital stock is $250,000.

**Tennessee & Alabama.**—H. Scott and Major Hays, of Louisville, have agreed to complete this partially-graded road between Trenton and Milan, Tenn. It is proposed to build to the Nashville, Chattanooga & St. Louis at Huntington, thence through Milan and Trenton to Dyersburg on the Newport News & Mississippi Valley road. That they will build the line this year is considered doubtful.

**Tiffin & Fremont.**—The company has asked bids for building the line, and as soon as the contract is let it is expected that grading will be commenced, and the construction work pushed to completion as soon as possible. The road is to extend from Marblehead to Upper Sandusky, O., 65 miles, and of this about 25 miles have been already graded. J. G. Kaney, of Toledo, is Chief Engineer.

**Toledo Western.**—The charter of this company was filed in Ohio last week. It proposes to build a road from Toledo west through Angola and La Grange, Ind., and thence to Chicago. The divisions in Indiana and Illinois have been incorporated under different names; in Indiana as the Indiana Northern and in Illinois as the Chicago & Eastern. The capital stock of the Ohio company is $50,000; of the Indiana company $500,000, and of the Illinois company $100,000. The engineers will begin the surveys next week. A survey made about ten years ago will be followed. G. G. Hadley, of Toledo, is President.

**Union Pacific.**—Wood & Bancroft of Omaha, Neb., have been awarded the contract for a branch from Kearney, northwest, to Callaway, Neb., and work has already been begun.

It is stated that 400 teams and nearly 1,000 men are working on the extension of the Cheyenne & Northern from Wendover to Douglas, Wyo., 25 miles. Kilpatrick Bros. & Collins have the contract.

**Utah Central.**—The articles of incorporation of the roads forming this system were filed in Salt Lake City last week. The capital stock is placed at $6,000,000. The length of the different lines constructed and proposed aggregate about 300 miles.

Tracklaying will begin very soon on the graded section of the Utah Western division from Salt Lake City to Monahansett Beech. This line will be continued from Monehansett Beach to Grantsville, about 40 miles.

Some of the projected branches were mentioned on page 206, March 21. The following account refers to several additional branches and extensions: from a point in Salt Lake City at North Temple and Fourth West streets to First and T streets, seven miles; from Tenth East and Ninth South streets, via Sugar House, up Parley's cañon to Park City and Silver Creek, Utah, 35 miles; thence easterly to the Utah mountains, near Wolf's Creek Pass, and along the Du Chesne River to the junction of its two forks, 150 miles. Also from the main line at the Provo River, southerly to Heber City, eight miles. Also a branch line commencing at the main line near Ross' summit, thence easterly to the Weber River, a distance of 25 miles. Also a branch from Sugar House to Granite, a distance of 25 miles, with a branch from Hollidayburg or Brinton's to Union Forts, a distance of five miles, aggregating in all 250 miles.

**Washington & Lincolnton.**—A construction company has been organized by E. T. Shubrick, which has agreed to build this road between Washington & Lincolnton, Ga., a distance of 20 miles, for $50,000 in bonds of the road and $25,000 in cash.

## OLD AND NEW ROADS.

**Allegheny Valley.**—The annual report for the year to Dec. 31 last shows that the earnings of the road during the year 1889 were 2,369,985, an increase over 1888 of $271,020. The total expenses for 1889 were $1,372,588. an increase over 1888 of $174,551. The net earnings for 1889 were $997,396, an increase over 1888 of $96,469. The increase in operating expenses was 88 per cent. The deficiency in income to meet all liabilities was $289,758. The total deficit Dec. 31, 1889, was $7,587,573.

**Baltimore & Ohio.**—The earnings and expenses of the road for March, compared with March of 1889, are as follows: Earnings, 1889, $1,721,843, and 1890, $1,961,459, an increase of $239,616; expenses, 1889, $1,239,946, and 1890, $1,383,990 an increase of $155,044; net, 1889, $487,897, and 1890, $572,469, an increase of $84,572. The earnings and expenses for the six months of the fiscal year 1889-90, compared with the same months of the fiscal year 1888-9 (March, 1890, approximated) are as follows: Earnings, 1889, $9,999,730, and 1890, $11,808,286, an increase of $1,808,556; expenses, 1889, $7,312,924, and 1890, $8,127,315, an increase of $814,391; net, 1889, $2,686,806, and 1890, $8,127,315, an increase of $814,391; net, 1889, $2,686,806, and 1890, $3,770,971, an increase of $1,084,165.

**Buffalo, Rochester & Pittsburgh.**—The control of this road has been secured by Bell, Lewis & Yates, of Rochester, N. Y., that firm having purchased the stock held by Adrien Iselin, which in addition to the shares it already owned gives the firm a majority of the stock. The stock purchased from Mr. Iselin is said to have been $4,000,000 par value. No statement is made giving the price at which control was sold. The control of the Rochester Coal & Iron Co. goes with the railroad company, as the latter owns 40,000 shares coal and iron stock. Bell, Lewis & Yates are large coal miners and their output of bituminous coal with that of the Rochester Coal & Iron Co. was 2,700,000 tons last year. The road purchased extends from Rochester, N. Y., to Howard Junction Pa., 129 miles; from Clarion Junction, Pa., to Walston, Pa., 65 miles, and from Buffalo Creek, N. Y., to Ashford Junction, N. Y., 45 miles. Including branches, the company operates 180 miles in New York and 117 miles in Pennsylvania. Mr. A. G. Yates, of Rochester, will succeed Mr. A. Iselin, Jr., as President.

**East Tennessee, Virginia & Georgia.**—At the special stockholders' meeting in Knoxville, Tenn., April 15, the directors were given power to act in all the matters mentioned in the call for the meeting, as published in our issue of March 28.

**Evansville & Richmond.**—Work on this road east of Seymour, Ind., has been suspended in consequence of the agreement between the Evansville & Terre Haute and the Cleveland, Cincinnati, Chicago & St. Louis for the control of the Cincinnati, Wabash & Michigan. A line will probably be built between Anderson and Rushville, the tracks of the Cleveland, Cincinnati, Chicago & St. Louis being used to connect the lines.

**Fort Wayne, Cincinnati & Louisville.**—The control of this line has been sold by Elijah Smith to Senator Calvin S. Brice, President of the Lake Erie & Western, and the stockholders of the latter road have been asked to ratify the purchase. The price paid for the road will be a little less than $2,000,000, or about 50 cents on the dollar for its stock. It is proposed to raise this sum by the issue of Lake Erie & Western bonds to the amount of $10,000 per mile, or a total of $1,330,000. The balance, it is intended, shall be provided from the net earnings of the road. The Fort Wayne line earned in 1889 $100,000 net, or 2½ per cent. on its stock. In a circular to stockholders President Brice states that while the road costs perhaps $25,000 per mile, the purchase price will be between $14,000 and $15,000 a mile. By the consolidation, the capital stock of the Lake Erie & Western will stand about $16,000 per mile, common and preferred stock, instead of $20,000 each, as at present.

**Kanawha & Ohio.**—The United States Circuit Court at Wheeling, W. Va., did not confirm the sale of this road to the Chesapeake & Ohio, as was expected. The refusal to grant the order was on account of a number of bondholders objecting to the lease.

**Knox & Lincoln.**—The syndicate which is negotiating for the purchase of this road has increased its offer of $1,300,000 for the franchise and property of the company to $1,500,000. Of this sum $250,000 will be paid in cash on the acceptance of the offer and the balance in 30-year four per cent. bonds. This offer will be submitted to the towns who own the majority of the capital stock, and it is believed that it will be accepted.

**Louisville, New Albany & Chicago.**—The company has secured an injunction in the United States Circuit Court at Cincinnati restraining the Richmond, Nicholasville, Irvine & Beattyville, Louisville Southern and the Ohio Valley Contract & Improvement Co. from selling any of the bonds of the issue of $2,250,000 of the first named road which were guaranteed by the former management of this road. The present board of directors have repudiated the guarantee on the ground that it was not ratified by the stockholders. The construction company which is building the line has begun suit in the Chancery Court, at Louisville, to compel the Louisville, New Albany & Chicago to pay the interest on the bonds in dispute.

The company has brought suit at Louisville against the Kentucky & Indiana Bridge Co. to annul the contract by which the road agreed to use the bridge for a certain term of years, holding that the contract was not legally sanctioned and is null and void, and that it interfered with a previous contract with the Louisville Bridge Co.

**Macon & Atlantic.**—Officers of the Macon Construction Co. have organized this company to build a road from Macon to Savannah, Ga., or to a point near there on the Savannah River in Effingham County. The route is through the counties of Bibb, Twiggs, Pulaski, Wilkinson, Laurens, Johnson, Emanuel, Montgomery, Tattnall, Bullock, Bryan, Effingham and Chatham.

**Manufacturers.**—The company has been incorporated in Illinois to build a road from Thornton, in Cook County, to Blue Island and Chicago. The principal office is at Chicago, and the capital stock is $150,000. The incorporators and first Board of Directors are: John P. Wilson, Nathan G. Moore, Houston C. Adcock, Alfred E. Spink and William B. McIlvaine, all of Chicago.

**Milwaukee, Lake Shore & Western.**—The annual report for the year ending Dec. 31, 1889, shows earnings of $3,474,667 and miscellaneous receipts of $15,293. Operating expenses and taxes were $1,954,203, leaving net receipts of $1,535,757. The balance to the income account after the payment of seven per cent. in dividends on the common stock was $287,494, making the income account balance $482,422.

**New London Northern.**—The Railroad Committee of the Massachusetts Legislature has reported in the House a bill allowing the road to lease itself to the Consolidated Railroad of Vermont.

**St. Louis, Arkansas & Texas.**—The Mercantile Trust Co., of New York, the trustees, have filed a bill of complaint in equity in the United States Circuit Court at St. Louis asking for the foreclosure of the second mortgage bonds and an order of sale of the road under the second mortgage. The second mortgage covers all the track, land, rolling stock and property of all kinds, real and personal, in Missouri, Arkansas, Louisiana and Texas, and similar proceedings will be begun in those states. Foreclosure proceedings under the first mortgage are now pending.

A compromise has been effected between the two reorganization committees. By the agreement the assessment on the stock is reduced to $8.50 per share, for which the depositor receives $10 in new four per cent. second mortgage income certificates. The assessment on the six per cent. second mortgage certificates is reduced to 3½ per cent., for which the depositor receives five per cent. second mortgage incomes.

**Tacoma & Lake City.**—It is stated that the Union Pacific has secured control of this road and will extend it to Olympia, Wash. It is built from Tacoma to American Lake.

**Ulster & Delaware.**—In the action brought to vacate the charter of the company, there was handed down a decision this week in favor of the defendant. The opinion states, first, that the action of the people was barred by the Statute of Limitations, and, second, that the act of 1889, under which the railroad commissioners have jurisdiction to settle the terminal of roads by filing certificates, etc., is constitutional. The suit was brought because the road refused to build to a town which had issued bonds in its favor and to which it had agreed to extend.

**Union Pacific, Denver & Gulf.**—Articles of consolidation have been filed under this name in Colorado, instead of as the Pacific, Denver & Gulf, as reported on page 241. The consolidated lines consist of the Colorado Central; Georgetown, Breckenridge & Leadville; Denver & Middle Park; Denver, Marshall & Boulder; Greeley, Salt Lake & Pacific; Denver, Texas & Gulf; Denver, Texas & Forth Worth; Road Canyon, Chicosa Canyon, Canyon de Aguo, Colorado Central of Wyoming, and the Cheyenne & Northern. The action was merely formal, after the recent meetings of the stockholders of the several companies, at which the consolidation was ratified.

**Union Pacific.**—President Adams states that the Union Pacific, Denver & Gulf is earning more than its interest at the present time, and the prospect is that this company and the Oregon Short Line will soon have as good a credit as the Union Pacific. The floating debt, occasioned wholly by the purchase of the Oregon Railway & Navigation stock, is being reduced, and outside of the net earnings the Union Pacific will have within the next 60 days from the proceeds of its bond subscriptions, etc., a return of about $5,500,000. Statistics show reductions of the fixed charges of the Union Pacific by the funding of the debt coming due in the next nine years. If funded at five per cent. the saving per annum would be $1,186,665; at four per cent. $2,069,070.

**Washington Southern.**—A meeting of stockholders will be held April 30 to vote on a proposed issue of bonds to the amount of $2,500,000, secured by a first mortgage.

**Wisconsin Central.**—The President of the road has issued a letter announcing that as the lines hitherto operated by the Wisconsin Central Co. and the Wisconsin Central Railroad Co., all of which lie between St. Paul, Ashland, Eau Claire, Portage, Milwaukee and Chicago, and are known as the Wisconsin Central system, have been leased for 99 years from April 1, to the Northern Pacific Co., that company is now in possession of and operating the lines.

## TRAFFIC.

### Chicago Traffic Matters.

CHICAGO, April 16, 1890.

The General Passenger and Ticket Agents' meeting again adjourned without having accomplished anything. They voted to submit the proposed new passenger agreement to the various lines in the territory, and let each formulate such changes or provisions as they wished incorporated, and submit them to the secretary, when another meeting will be called.

As was to be expected, the Western Freight Association declined to authorize the requests of the Chicago & Alton to put in a rate of 10 cents per 100 lbs. on lumber, Chicago to Missouri River points; 12 cents per 100 on packing house products, carloads, Kansas City to Chicago; and to be allowed to make a rebate on interstate shipments of live stock in common cars of an amount equal to the usual car mileage for double the distance hauled. The Alton accordingly gave notice of its intention to put in the rates, notwithstanding the adverse votes of the association, within ten days. The rate committees took the matters up, but being unable to complete the changes incident upon the putting in of the new rates, adjourned until yesterday, when they again assembled, but accomplished nothing. To-day the Alton gave the agreed six days' notice that it would put into effect on April 22 all three reductions. Vice-President McMullen said in explanation: "This is not done to demoralize rates. We know absolutely that our competitors are doing secretly what we are now doing openly." The rate committee meets to-morrow to equalize all rates to the reduced basis made by the Alton, the reduced rates to go into effect April 22 on all lines. A resolution to raise local rates to the old 60-cent basis, Chicago to St. Paul, and to ignore the long and short haul clause of the Interstate Commerce Act, by continuing in effect the low through proportions, came within one vote of passing. The Chicago & Northwestern was the one line which opposed the advance.

The Missouri Pacific to-day reduced to $6 the first-class passenger rate, Kansas City to Pueblo. The Rock Island was hardly a half-hour behind in a notice of a corresponding reduction to Denver, Pueblo and Colorado Springs. All other Denver lines will doubtless make the same reduction, and the same rates will be made eastbound.

The western lines last week received a communication from Commissioner Morrison, calling their attention to a letter which had been laid before the Commission by one of the Iowa Senators which inclosed a complaint from that state of what the writer believed to be an unjust discrimination against certain portions of Iowa, particularly the southwestern part, by the western lines in arranging for "Home Seekers'" excursions, the tickets for which are not available for all portions of the state. The complainant argues that among the principal causes of the great depreciation of farm land in southwestern Iowa "is the fact that excursionists are not allowed to stop off in this part of the state and see our lands, and therefore pass through our state and go to other sections, not so good or so well settled or improved." In transmitting the complaint, Commissioner Morrison said: " . . . It is questionable if reduced rate tickets to home seekers are excursion tickets." The roads considered the matter, and sent the following reply:

"The term 'home-seekers' is merely the name of the excursion; the tickets are to be publicly announced, and will be open to all. In this respect they are entirely different from the 'explorers' tickets' and 'settlers' tickets' considered by the commission in the case of Smith vs. Northern Pacific Railroad Company, which were sold only to persons representing themselves as intending to go out and inspect defendant's lands with a view to purchase, or to actual settlers accompanied by their emigrant effects. Our excursions in this respect are similar to the ordinary excursions for a countyfair or camp-meeting or a circus, which receive the name of the meeting or convention in behalf of which the concession in rates is allowed, but tickets are sold to every applicant without any inquiry as to whether they actually attend the fair or other gathering in question. While the name 'home-seekers' is used, as expressing the idea on which the excursion privilege is based, there is no attempt to restrict the sale of tickets to any class of persons, but on the contrary they are expected to be sold to all alike.

"Upon the question of discrimination against localities, every excursion is a discrimination in that sense. A reduced rate upon a given day to a fair at Atchison necessarily discriminates against Leavenworth, St. Joseph and other neighboring cities. Whether any discrimination is unjust or not depends upon the similarity of circumstances; and we understand section 22 of the act to mean that the sale of excursion tickets to one point and not to another shall not be held an unjust discrimination. It is provided that nothing in this act shall prevent the issuance of excursion tickets; this is understood to leave with the carriers the right of selecting the occasions and the places where and when such tickets shall be used; and it has never before been suggested, to our knowledge, that the making of excursion rates to one point entitled the citizens of another point to demand them.

"The minimum rate of $17.50 was applied in the present case from the fact that it was believed that $5 added to the Missouri River rate of $12.50 would protect this issue of tickets from manipulation by brokers and scalpers in Missouri river traffic. The establishment of this minimum draws an arbitrary line, on this side of which the excursion rates are not made. This was not done for the purpose of injuring any part of Iowa or Missouri, but was thought to be a proper limitation under the circumstances."

### Traffic Notes.

Shipments of corn out of Kansas have decreased rapidly since April 1.

The Chicago, Burlington & Quincy office in San Francisco has announced a second-class passenger rate of $35 to Chicago.

A Memphis firm has ordered a single shipment of 1,000 barrels of granulated sugar from New Orleans over the Illinois Central.

The Canda Cattle Car Co. on April 1 had orders for 815 of its cars for the shipment of cattle from points on the line of the Texas & Pacific.

The scarcity of potatoes in California has led to the shipment of large quantities to that state from Minnesota, Iowa and Wisconsin. The potatoes sell in San Francisco at about $1.80 per bushel in the cars.

A wholesale lumber firm of Atchison, Kan., has ordered 1,500 tons of lumber from Clinton, Ia., to be sent by boat. It is claimed that $2,000 can be saved on the transportation charges over the prevailing railroad rates.

The first shipments taken by the Erie canal boats this season were contracted at the rate of 4 cents per bushel on wheat and 3¾ cents on corn from Buffalo to New York. The opening rate on coal from Buffalo by vessel is 50 cents a ton to Chicago and Milwaukee.

The Kansas Railroad Commissioners have, on the complaint of citizens, ordered the Missouri Pacific to put on a daily passenger train between Fort Scott and Topeka. A similar decision concerning the Le Roy & Caney Valley line is reported in another column.

The Iowa Railroad Commissioners have begun suits against various railroads; one for refusing to construct an underground crossing, one for abolishing a station without authority, and one for refusal to adopt the commissioners' tariff on shipments between termini within the state, but whose route is partly outside of the state.

The Peoria Board of Trade has sent a memorial to the Interstate Commerce Commission complaining of the difference between the rates on corn and those on oats now in force on the railroads to the Atlantic seaboard, and calling attention to the fact that to interior points west of trunk line termini this difference is not maintained.

A Chicago court has granted an injunction restraining the Illinois Central Railroad and E. D. Moore, Manager of the Chicago Car-Service Association, from refusing to supply Woodward & Crofut, of the Chicago Cereal Mills, at Grand Crossing, with cars. The complainants say that last summer there was a delay of several days in moving cars on the side-track of the Illinois Central, which runs to the mill. When the company became able to supply cars, it sent them along so fast that the millers could not handle them. Moore sent a bill of $60, which he afterward cut down to $45, for demurrage. Woodward & Crofut refused to pay the bill, claiming to have lost $60 a day through the company's fault at the time when the cars were not furnished when needed. On account of their refusal to pay the $45, Moore ordered that no grain consigned to Woodward & Crofut's mill should be received by the company, and that no cars be furnished the firm to take away their shipments. An injunction has also been granted against the Pennsylvania Co. and E. D. Moore at the instance of the Chicago Coal & Coke Co., restraining the road from "refusing to deliver cars of coal" to the complainants.

### The Interstate Commerce Commission.

The Commission, by Mr. Bragg, Commissioner, has decided two cases of the New Orleans Cotton Exchange against the Illinois Central and seventeen others, and the Cincinnati, New Orleans & Texas Pacific and ten others, involving the reasonableness of rates on cotton from interior points in the cotton-growing country to New Orleans, as compared with rates on compressed and uncompressed cotton to northern and eastern mills, by rail direct. The Commission corrects, by adjustment, the relative rates from Jackson and Meridian to New Orleans, and overrules the complaint on all other grounds. The circumstances under which complainants ask that rates be made equal are found to be dissimilar and wholly unlike. The difference in the rate on compressed and uncompressed cotton by rail carriers should be the actual and necessary cost of compressing. The Commission will not order the rail carriers to transport cotton on flat cars instead of in box cars to New Orleans, the rate being the same on each, no injury being shown to have resulted to petitioner or to that city, or to any shipper from the carriage in box cars.

The Commission has decided the case of D. S. Alford against the Chicago, Rock Island & Pacific in favor of the defendant. The road runs through trains over the Union Pacific between Kansas City and Topeka, but the contract provides that no intermediate business shall be done. Alford complained that the Rock Island refused to receive and discharge traffic at Lawrence, one of the intermediate towns. The Commission holds that the Rock Island is not bound to do the local business prohibited by its contract with the Union Pacific.

### East-bound Shipments.

The shipments of east-bound freight from Chicago by all the lines for the week ending Saturday, April 12, amounted to 69,873 tons, against 70,830 tons during the preceding week, a decrease of 957 tons, and against 42,194 tons during the corresponding week of 1889, an increase of 27,679 tons. The proportions carried by each road were:

| | W'k to Apr. 12. | | W'k to Apr. 5 | |
|---|---|---|---|---|
| | Tons. | P. c. | Tons. | P. c. |
| Michigan Central | 7,831 | 11.2 | 8,881 | 12.6 |
| Wabash | 2,747 | 3.9 | 2,539 | 3.6 |
| Lake Shore & Michigan South. | 12,319 | 17.6 | 12,676 | 17.9 |
| Pitts., Ft. Wayne & Chicago | 8,545 | 12.2 | 8,876 | 12.5 |
| Chicago, St. Louis & Pitts. | 8,269 | 11.8 | 9,715 | 13.7 |
| Baltimore & Ohio | 5,771 | 8.3 | 6,382 | 9.0 |
| Chicago & Grand Trunk | 8,641 | 12.4 | 8,662 | 12 2 |
| New York, Chic. & St. Louis | 7,319 | 10 5 | 8,792 | 12.4 |
| Chicago & Atlantic | 8,431 | 12.1 | 4,307 | 6.1 |
| Total | 69,873 | 100 0 | 70,836 | 100.0 |

Of the above shipments 4,728 tons were flour, 33,317 tons grain, 2,577 tons millstuffs, 5,636 tons cured meats, 2,130 tons lard, 8,776 tons dressed beef, 1,117 tons butter, 1,581 tons hides, 290 tons wool and 5,652 tons lumber. The three Vanderbilt lines carried 39.3 per cent. of all the business, while the two Pennsylvania lines carried but 24.0 per cent.